# Journal of Electricity and Western Industry

25 Cents a Copy [illegible]22 San Francisco

## ANOTHER COAST THEATRE

—profiting by the experience of thousands of others throughout the world—installs

## WARD LEONARD DIMMERS

To the predominating list of famous theatres using Vitrohm Dimmers, is now added the name of Loew's State, Los Angeles. From the great old Hippodrome of New York, through the magnificent Cleveland Auditorium, to the new Grauman's Metropolitan, millions and millions of watts in lamp load are Vitrohm controlled because they are the only dimmers which **combine all** of these advantages:

Reliable operation under continuous duty
(all Vitrohm Dimmers are Continuous Duty Dimmers)
Smallest size and lightest weight
Mechanical ease and simplicity of control
Minimum maintenance costs

Theatrical owners, architects and engineers recognize these facts—every prospective user of dimming equipment will profit by such experience. Ask for complete details, and for a copy of our new bulletin "Theatre Lighting"—a copy of which will be gladly sent as soon as it is off the press.

**ELECTRIC MATERIAL COMPANY**

589 HOWARD STREET, SAN FRANCISCO

Hinckley Bldg., Seattle  Title Ins. Bldg., Los Angeles  AGENT FOR Ward Leonard Electric Company, Mount Vernon, New York

Lilibridge 99-796

# 1 9 2 3

THE Old Year fades into history as the New Year dawns. It is a time when we mingle thoughts of thankfulness with those of expectancy.

We choose this as one opportunity to express our appreciation for the courtesies extended us throughout the past year—which we trust has resulted in genuine satisfaction to all.

We would bespeak a continuation of our pleasant associations for 1923 with the assurance that nowise will our service be found wanting.


Baker-Joslyn Company

RELY ON SERVICE — LOS ANGELES — SEATTLE — SAN FRANCISCO

183-199 First St.
SAN FRANCISCO

330-332 Azusa St.
LOS ANGELES

2424-28 First Ave. So.
SEATTLE

*Distributers*

Hot Galvanized Pole Line Hardware
Wood Poles, Cross Arms and Pins
Construction and Linemen's Tools
Porcelain and Glass Insulators
Porcelain Knobs, Tubes and Cleats
Insulated and Bare Copper and Iron Wires
Rigid Iron Conduit and Fittings
Flexible Metallic and Non-metallic Conduit and Armored Conductors
Switches, Switchboards and Fuses
Insulating Materials



Journal of Electricity and Western Industry entered as second class matter February 17, 1921, at the post office at San Francisco, under the Act of Congress, March 3, 1879.
Published the 1st and 15th of each month, at Rialto Building, San Francisco, California.

DEC 29 1922 ©CIB554486


# Journal of Electricity and Western Industry

A McGraw-Hill Publication

Founded 1887

ROBERT SIBLEY, Editorial Director

Associate Editors:

Norman S. Gallison  Clotilde Grunsky  George C. Tenney

VOLUME 49  SAN FRANCISCO, DECEMBER 15, 1922  NUMBER 12


## Contents


**EDITORIALS** ..... 429

In Times of Peace Prepare for War—The Spread of the Electrical Home Idea Is Evidence of Its Value—The Fable of the Hardy Pioneers and the Cautious Wise Men—Signing of Compact First Step in Development of Colorado River—Need of Accurate Knowledge on Financing Rural Lines—Encouragement and Assistance Needed in Water Power Development—Few Industries Operate on as Narrow Margin as Do Utilities.

**ALHAMBRA'S ELECTRICAL HOME** — by George C. Tenney ..... 437

How R. E. Heerman, Enterprising Electragist of Alhambra, Calif., Staged a Highly Successful Electrical Home and Increased His Business $1,000 per Month at a Total Cost of $148.50.

**THE ELECTRICAL HOME FOR THE ELECTRICAL MAN** — by Norman S. Gallison ..... 441

A. E. Wishon, General Manager of the San Joaquin Light & Power Corporation, Has Demonstrated to the Public and the Electrical Industry that He Believes in the Utility of Electrical Appliances by Completely Electrifying His Own Home in Fresno.

**MODERN ELECTRICAL CONVENIENCES IN A MOUNTAIN CAMP** — by Charles Mathews ..... 447

The Comfort and Convenience of Doing It Electrically Is Demonstrated to Thousands of Tourists Who Visit Camp Curry in Yosemite Valley. Here Electricity Performs Every Domestic Task to Which It Can Be Applied.

| | | | |
|---|---|---|---|
| Current Comment | 432 | Meetings | 465 |
| Discussion | 434 | Personals | 466 |
| Electricity in Industry | 450 | Manufacturer, Dealer and Jobber Activities | 468 |
| Jobber, Dealer and Sales Agent | 452 | Trade Outlook | 469 |
| Industrial News | 460 | Construction News | 470 |



PUBLISHED SEMI-MONTHLY BY

**McGRAW-HILL COMPANY OF CALIFORNIA — Rialto Building — SAN FRANCISCO**

James H. McGraw, *President*
C. T. Hutchinson, *Vice-pres. & Gen. Mgr.*
C. M. Lindsay, *Vice-pres. & Treas.*

WASHINGTON, Colorado Building
CHICAGO, Old Colony Building
PHILADELPHIA, Real Estate Trust Building
CLEVELAND, Leader-News Building
ST. LOUIS, Star Building
NEW YORK, 10th Ave. and 36th St.

McGRAW-HILL CO., Inc., New York
Publishers of

American Machinist—European Edition (*Published in London*)
Industrial Engineer (*Published in Chicago*)
Chemical and Metallurgical Engineering
American Machinist — Ingenieria Internacional
Electrical World — Electric Railway Journal
Engineering and Mining Journal-Press
Bus Transportation — Engineering News Record
Coal Age — Electrical Merchandising — Power



Copyright, 1922, by McGraw-Hill Company of California.


Entered as second-class matter Feb. 17, 1921, at the Post Office at San Francisco, California, under Act of March 3, 1879.

Member Audit Bureau of Circulation.

Printed in U. S. A.

Subscription rates in United States, Canada, Mexico, Cuba, Porto Rico, U. S. Possessions, Argentina, Bolivia, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, Nicaragua, Panama, Honduras, Salvador, Uruguay, and Spain, $2.50 per year, 2 years $4.00. Elsewhere $4.00 Gold (17 Shillings). Single copy, 25c. When change of address is required, both old and new addresses must be given. Notice must be received two weeks before change takes place.


**Please enter my subscription to the "Journal" for 1 ( ), 2 ( ) years, for which please send bill.**
(Please print name and address plainly below)

# Some sensational technicalities

1. The Crawford Oven has a larger baking capacity than any other electric range oven of its type.
2. Crawford heat is scientifically circulated, and applied evenly to every area of the food: this prevents "spotty" cooking, burned surfaces and under-done interiors.
3. Crawford heat is retained by double insulation, for there is the heavy insulating material and an additional ½ inch air space. The spring door-latch, spring door-linings and exact fitting, keep the oven door constantly and securely hugging the frame, so that no heat escapes.
4. The same heating unit that does the baking also does the broiling on the **Crawford Adjustable Broiler** — an innovation in the economy of electricity.
5. The Crawford oven has a lower connected load than any other oven of equivalent cooking capacity.
6. A cake or pie may be withdrawn from the oven for inspection during cooking without lifting. The racks glide on smooth rack guides.
7. Oven linings, stoutly built, may be easily removed for an occasional scrubbing, and may be replaced after long service, at a slight expense, **without use of tools.** (The average life of ordinary oven linings in electric ranges is only seven years.)
8. Two Ovens in One—The Crawford oven may be used as a full sized cooking space, or, by use of the accelerator shelf, the size of that space may be reduced and the speed and economy of cooking increased in direct proportion.
9. The use of this accelerator shelf in the longer operations, gives a high temperature oven in the space below the shelf, and a low temperature oven above the shelf, **without using additional current.** Two dishes, requiring different temperatures, may be prepared in the separate spaces at the same time; it is ideal for roasting meat below, and preparing vegetables above, for the same meal, with the same clean heat.
10. Broiling on the Crawford Adjustable Broiler, and making the heat work double by baking in the oven at the same time, gives great economy, with absolutely no exchange of cooking flavors.

LESS than a year ago there were no Crawford Electric Ranges on the Coast. Today there are hundreds, each proving in actual use how the "Crawford made electric cooking perfect." One reason, among others, is that the rather startling claims made for the Crawford Oven are borne out by practical use. Central stations who are also merchants are realizing that the Crawford Electric Range *sells* and *proves.*

**Crawford**

## ELECTRIC RANGES

are made by

WALKER & PRATT MFG. CO.
BOSTON MASS.

**Burton Y. Gibson**
Pacific Coast Representative,
680 Folsom Street, San Francisco

and are distributed by

***Western Electric Company***
INCORPORATED

OFFICES IN ALL PRINCIPAL CITIES

# *In Times of Peace Prepare for War*

RELIEF, rather than exultation, was the feeling inspired by the defeat of the Water and Power Act in California. At first thought, it would appear that the verdict of the electorate was conclusive, since the measure was defeated by nearly two and a half to one, and that the incident was closed.

THERE are indications that the incident is anything but closed, as is shown by the formation of a permanent organization at Sacramento, California, a few weeks ago, for the purpose of continuing the fight. The thinking people of the West must not permit themselves to be lulled into a false sense of security. For a new Water and Power Act, perhaps more skilfully prepared than its predecessor, with many of its more vicious features either eliminated or camouflaged, may be expected to put in an appearance in time for the next general election two years hence, in other states as well as California.

LORD NORTHCLIFFE strove to impress upon his associates an appreciation of the power of repetition. He demonstrated that to drive a point home in the mind of the average citizen, it must be repeated again and again. Publicity is the most effective weapon for combating the Russianization of the hydroelectric power industry. Frank, honest, truthful presentation of the facts will clear the clouds from the minds of such people as the two hundred thousand voters who mistakenly recorded their belief in the Water and Power Act.

GRIEVANCES held against the power companies by individual consumers must be explained and corrected. Either rates should be simplified or the basis for the determination of rates should be expounded by word of mouth and in the public prints in plain, simple language understandable by the layman. Little things, if permitted to lapse, often exert an entirely disproportionate influence upon the affairs of man. A pig once started a war; a cow set fire to a great city. The plan of extending the privilege of part ownership among consumers should be pushed even more vigorously than it has in the past.

SOME of the western power companies have not even established departments of public relations, while others do not give this part of their work the attention it deserves. It is not sufficient that the present-day slogan, 'The Public be Pleased,' has become second nature with all of the higher officials of the power companies; the general public must be equally cognizant of this fact, and there is no better way of bringing this about than by practical demonstration.

### The Spread of the Electrical Home Idea Is Evidence of Its Value

TWELVE Electrical Homes have been built and exhibited in the West in the past year. One hundred and sixteen thousand people visited the seven homes which are described in this issue, located in Seattle, Oakland, Alhambra, Stockton, Calexico, and Vancouver, B. C. It is estimated that another hundred thousand visited the five other homes at Denver, Salt Lake City, Boulder, Spokane and Tacoma, erected during the year and which have been previously described and illustrated.

The spread of the Electrical Home idea is evidence that no other form of advertising produces results comparable with those accruing from the staging of a successful exhibition of this kind. The exhibitions have been uniformly successful and the electrical interests cooperating to place these educational exhibits before the public have been well repaid.

The public is becoming sold on the advisability of having its homes adequately wired to make full use of electrical servants and of the benefits of correct illumination. Architects, builders and real estate men are capitalizing on the advantages of completely wiring homes and apartments, in fact, several builders are erecting nothing but "electrical homes." The public is interested in electrical comfort and electrical convenience bringers and has evidenced this interest by the increased purchases of domestic appliances in every city in which a home has been displayed.

Of the various methods of promoting practical cooperation, not only between the branches of the electrical industry, but between the electrical industry and its valuable ally "the public," the Electrical Home stands supreme. It produces results.

---

### The Fable of the Hardy Pioneers and the Cautious Wise Men

THERE was once a mythical country, possessing wonderful undeveloped natural resources. It had large forests of timber, countless acres of fertile land, coal, oil and other minerals in abundance. It had a profusion of game, its streams and lakes abounded with fish and its climate was mild and temperate. But this magnificent mythical country was inhabited by a tribe of warlike savages. It was surrounded by stretches of barren desert, of forbidding mountains which defied all but the most daring and resourceful.

As time passed a hardy group of pioneers crossed the forbidding mountains, endured the hardships of the desert wastes, and subdued the savage tribes, building their homes in the mythical country. They were followed by other pioneers who built railroads and made the country easy of access. Soon there came great crowds of cautious people, cautious in that they avoided the dangers and hardships, but wise people, wise because they knew a good thing when they saw it. They promptly occupied the fertile acres, utilized the forests and minerals, pushing the pioneers unceremoniously aside. The pioneers were skilled and accomplished in their way, but they were careless and did not adapt themselves to the changed conditions.

Pioneering days are largely over in the electrical industry. The pioneer electrical dealers are still in possession of the field.

But the day will soon be here when most electric appliances, like the electric iron, will no longer be classified as "specialties" but will be listed as "staple commodities." When that day arrives these commodities must be made available to the purchasing public in channels of distribution which will be readily accessible.

The electrical industry has borne and will bear the brunt of pioneering in the popularizing of domestic appliances. The electrical dealer will temporarily set the pace. But once the pioneering days are definitely over and it seems safe for the cautious and canny merchant, who has previously avoided contact with electrical lines, to aggressively enter the field, the electrical pioneer, unless he can adopt the intensive merchandising tactics of his competitors, will follow the pioneers of the mythical country.

---

### Few Industries Operate On as Narrow Margin as Do Utilities

ONE of the large transportation companies carrying interurban traffic across San Francisco Bay, made last year a net profit of one-half mill per passenger out of the eighteen-cent fare charged. In other words, after paying operating expenses, including wages, depreciation and bond interest, the company had to haul twenty people in order to make one cent which might be applied toward dividends. On the package of gum which it sells from the news stands of its ferry boats, it secures as much profit as it does from transporting fifty people from 4 to 10 miles by rail and water.

Few industries operate on as narrow a margin of profit as do public utilities. Few industries pay as great a percentage of their gross earnings for labor and taxes, as do public utilities. Few industries in order to secure business, do the pioneering work which falls to the lot of the public utilities. No industry requires more efficient management in order to earn dividends than do public utilities, whose earnings are limited by law and whose success or failure rests on the shoulders of the management.

---

### Signing of Compact First Step in Development of Colorado River

UNDER a provision of the Constitution, almost obsolete, which provides that states may make treaties among themselves, the seven states in the Colorado River basin, through representatives appointed by the various governors, signed a compact which should insure amicable development of our greatest natural resource. This treaty must be ratified by the several legislatures of the states involved and by Congress, then it becomes the law of the land.

In the treaty an equitable division and apportionment of the use of the waters is made. The river is divided into two basins, separated by the Grand

Canyon, and in the treaty proper recognition is given to the widely divergent needs of the two areas, with their attendant problems, rights and prospects. Agriculture takes precedence over power and industrial development in the treaty as signed, but there is plenty of water available in the great river to supply the needs of both agriculture and industry, and the development of one cannot but supplement the other. With the erection of a dam at Boulder Canyon, that is immediately and urgently needed, the danger of floods will be obviated and a remarkable power site will be added to the resources of the West.

The expeditious agricultural and industrial development of the two Colorado River basins, the storage of waters, and the protection of life and property from floods, will increase the productive area of the nation by four million acres, and will permit the development of four milion horsepower in energy. The Colorado is the greatest undeveloped natural resource of the nation. With power, and with the assurance of a plentiful supply of food products raised by the people of the reclaimed land, who would furnish the outlet for the manufactured products of industry, the prosperity of the Southwest seems assured.

Let there be no delay in the ratification of the treaty.

## Encouragement and Assistance Needed in Water Power Development

A REVIEW of the work of the Federal Power Commission during the two years of its operation clearly indicates the practical value of the Federal Water Power Act and the task now confronting the commission. Due to the many years' delay in securing adequate Federal legislation, it was but natural that a flood of applications should have followed immediately upon approval of the Act. Nevertheless, during its second year there have been filed with the commission applications aggregating a net total of 5,000,000 hp. of proposed installation. This amount, added to the applications of the preceding fiscal year, makes a grand total of 321, involving in excess of 20,000,000 hp. This amount is more than twice the existing water power installation of the United States, and more than six times the aggregate of all applications for power sites under Federal control in the preceding 20 years.

The chief purpose in the creation of the commission was to secure a common policy and a single executive agency in water power administration. Due to the situation in which the commission has been placed, this purpose has not been accomplished. Other agencies have been required to continue their independent activities, and these activities are not controlled by a common plan and are not subject to a common direction. This defect will not be cured, the policy of Congress cannot be fully executed, and the commission will not be able to perform in full the duties plainly intended by the Act until it is given authority to employ an adequate personnel of its own for its Washington office, and until it is given the administrative authority over all Federal water power grants, whether issued under the existing or under prior laws. It is important that amendment of the Act in these respects be no longer delayed. Having waited ten long years for a legislative pronouncement of a government policy respecting the utilization of our water power resources, we should not be required to wait another long period of years before means are provided for the execution of that policy.

There is more water power development under way at the present time than at any previous period in our history. The greater part of it is being developed under the provisions of the Federal Water Power Act. There is much more waiting to be used. To increase the supply of electric energy and reduce its cost, we must utilize our water powers to the fullest practicable extent. Eighty-five per cent of our potential water powers are under Federal control. We have a law which, though by no means perfect, does provide reasonably satisfactory conditions and under which large scale development is proceeding. Instead of being obliged to drift along the obstacles should be cleared away, and there should be substituted a positive attitude of encouragement and assistance in water power development.

## Need of Accurate Knowledge on Financing Rural Lines

THE question of the method of financing extensions into rural districts is engaging the attention of central station men since the use of electricity on the farm has become more general, particularly during the past year as better economic conditions have permitted the farmer to seek electric service. The adoption of a comprehensive policy which will correct the mistakes of the past and lay a firm foundation for future guidance is needed. The National Electric Light Association has published an excellent report on the subject through its Rural Lines Committee. Local divisions, notably the Northwest Electric Light and Power Association, have studied this problem and published reports.

Local conditions, established practices and accounting methods vary widely and it is doubtful if a general policy could be formulated which would fit individual districts. Provision should be made in each locality where the problem of financing rural lines is a pressing one, to have studies undertaken covering an extended period, that the cost of operation and maintenance can definitely be determined. Large distribution losses, low load factor and low power factor are characteristic of rural installations. Maintenance of lines, meters and transformers, as well as their inspection, resetting or testing, in addition to trouble service, involve special problems as compared with city distribution lines.

The problem is now largely a central station one but the discussion will extend to farm organizations and the rural press. It will be far better to solve the problem by cooperative action wherein facts may be weighed with reference to sound economics than to have the matter threshed out in the political arena.

# CURRENT COMMENT

**Colorado River Compact Means Much to West**

Casting aside jealousies which have delayed the development of the Colorado River for many years and exercising a right under the constitution of the United States which has been almost totally unused for nearly 140 years, representatives of the seven states comprising the Colorado River basin together with Herbert C. Hoover, Secretary of Commerce and representative of the national government, have drawn up "The Treaty of Bishops Lodge," a compact which promises to settle for all time the controversies which have existed over the distribution of the waters of the main artery of the Southwest.

The Colorado River Commission, after twelve months' serious consideration of the complex problems, rights and prospects of the areas affected, and a series of 27 consecutive meetings at Santa Fe, N. M., on Nov. 24 signed an agreement which divides the waters of the river and stipulates that agriculture shall take precedence over power generation and industry in the use of water. When ratified by the legislatures of the seven states and by Congress, the agreement will become a part of the law of the land.

Secretary of Commerce Hoover, in a statement issued immediately following the signing of the agreement, outlined the significance of the document when he said:

"The big thing about the Colorado River compact is that it breaks the blockade on development of the whole river; it allows us all to go ahead with river development and with flood protection for the Imperial Valley.

"The worst thing about the compact is that it will destroy much oratory; it makes for spinach, and not for speech.

"One can get great emotion over conflict and quarrel. But there is no great oratory about the facts that the northern basin is separated from the southern basin by 1,000 miles of barren canyon; that the agricultural and economic life of the two basins are wholly different and that the logical thing to do is to divide the waters between them so they can make homes instead of defending injunctions. Nor can one make great oratory out of the fact that there is ample water and to spare, after the apportionment of enough water to each basin in perpetuity, to cover all of the present users, plus all of the known feasible projects, plus 30 per cent for good measure, then holding in reserve 30 per cent for forty years to see where it is most needed.

"There is nothing sensational about a compact that leaves all question of Mexican right to water to the state department, which is the only organ of the American people which has any right to deal with this question.

"There is nothing especially romantic about the provisions in the compact for the complete priority of agriculture over power, in the use of the water of this river.

"Yet behind all the praise and commonplace language of this compact lies the greatness and romance of the West, the building of a million more homes out under the blue sky in security and good will."

The compact as finally signed by the various state representatives follows:

**Article I.** The major purposes of this compact are to provide for equitable division and apportionment of the use of the waters of the Colorado River system, to establish the relative importance of different beneficial uses of water, to promote interstates comity, to remove causes of present and future controversies, and to secure the expeditious agricultural and industrial development of the Colorado River Basin, the storage of its waters, and the protection of life and property from floods. To these ends the Colorado River Basin is divided into two basins, and an apportionment of the use of part of the water of the Colorado River system is made to each of them with the provision that further equitable apportionments may be made.

**Article II.** As used in this compact: (A) The term "Colorado River System" means that portion of the Colorado River and its tributaries within the United States of America. (B) The term "Colorado River Basin" means all of the drainage area of the Colorado River System and all other territory within the United States of America to which the waters of the Colorado River System shall be beneficially applied. (C) The term "States of the Upper Division" means the States of Colorado, New Mexico, Utah, and Wyoming. (D) The term "States of the Lower Division" means the States of Arizona, California, and Nevada. (E) The term "Lee Ferry" means a point in the main stream of the Colorado River 1 mile below the mouth of the Paris River. (F) The term "Upper Basin" means those parts of the States of Arizona, Colorado, New Mexico, Utah, and Wyoming within and from which waters naturally drain into the Colorado River System above Lee Ferry at and also all parts of said States located without the drainage area of the Colorado River System which are now or shall hereafter be beneficially served by waters diverted from the system above Lee Ferry. (G) The term "Lower Basin" means those parts of the States of Arizona, California, Nevada, New Mexico, and Utah within and from which waters naturally drain into the Colorado River system below Lee Ferry, and also all parts of said States located without the drainage area of the Colorado River system, which are now or shall hereafter be beneficially served by waters diverted from the system below Lee Ferry. (H) The term "Domestic Use" shall include the use of water for household, stock, municipal, mining, milling, industrial, and other like purposes, but shall exclude the generation of electrical power.

**Article III.** (A) There is hereby apportioned from the Colorado River system in perpetuity to the upper basin and

to the lower basin, respectively, to exclusive beneficial consumptive use of 7,700,000 acre-ft. of water per annum, which shall include all water necessary for the supply for any rights which may now exist. (B) In addition to the apportionment in paragraph (A) the lower basin is hereby given the right to increase its beneficial consumptive use of such waters by 1,000,000 acre-ft. per annum. (C) If, as a matter of international comity, the United States of America shall hereafter recognize in the United States or Mexico any right to use of any waters of the Colorado River system, such waters shall be supplied first from the waters which are surplus over and above the aggregate of the quantities specified in paragraphs (A) and (B), and if such surplus shall prove insufficient for this purpose, then the burden of such deficiency shall be equally borne by the upper basin and the lower basin, and whenever necessary the States of the upper division shall deliver at Lee Ferry water to supply one-half of the deficiency so recognized in addition to that provided in paragraph (D). (D) The States of the upper division will not cause the flow of the river at Lee Ferry to be depleted below an aggregate of 75,000,000 acre-ft. for any period of 10 consecutive years reckoned in continuing progressive series beginning with the first day of October next succeeding the ratification of this compact. (E) The States of the upper division shall not withhold water, and the States of the lower division shall not require the delivery of water which can not reasonably be applied to domestic and agricultural uses. (F) Further equitable apportionment of the beneficial uses of the waters of the Colorado River System unapportioned by paragraphs (A), (B), and (C) may be made in the manner provided in paragraph (G) at any time after October 1, 1963, if and when either basin shall have reached its total beneficial consumptive use as set out in paragraphs (A) and (B). (G) In the event of a desire for a further apportionment as provided in paragraph (F) any two signatory States, acting through their governors, may give joint notice of such desire to the governors of the other signatory States and to the President of the United States of America, and it shall be the duty of the governors of the signatory States and of the President of the United States of America forthwith to appoint Representatives, whose duty it shall be to divide and apportion equitably between the upper basin and lower basin the beneficial use of the unapportioned water of the Colorado River System as mentioned in paragraph (F) subject to the legislative ratification of the signatory States and the Congress of the United States of America.

**Article IV.** (A) Inasmuch as the Colorado River has ceased to be navigable for commerce and reservation of its waters for navigation would seriously limit the developments of its basin the use of its waters for purposes of navigation shall be subservient to the uses of such waters for domestic, agricultural, and power purposes. If the Congress shall not consent to this paragraph, the other provisions of this compact shall nevertheless remain binding. (B) Subject to the provisions of this contract, water of the Colorado River system may be impounded and used for the generation of electrical power but such impounding and use shall be subservient to the use and consumption of such water for agricultural and domestic purposes and shall not interfere with or prevent use for such dominant purposes. (C) The provisions of this article shall not apply to or interfere with the regulation and control by any state within its boundaries of the appropriation use and distribution of water.

**Article V.** The chief official of each signatory State charged with the administration of water rights, together with the director of the United States Reclamation Service and the director of the United States Geological Survey shall cooperate, ex officio: (A) To promote the systematic determination and co-ordination of the facts as to flow, appropriation, consumption, and use of water in the Colorado River Basin, and the interchange of available information in such matters. (B) To secure the ascertainment and publication of the annual flow of the Colorado River at Lee Ferry. (C) To perform such other duties as may be assigned by mutual consent of the signatories from time to time.

**Article VI.** Should any claim arise between any two or more of the signatory States: (A) With respect to the waters of the Colorado River system not covered by the terms of this compact. (B) Over the meaning or performance of any of the terms of this compact. (C) As to the allocation of the burdens incident to the performance of any article of this compact or delivery of waters as herein provided. (D) As to the construction or operation of works within the Colorado River Basin to be situated in two or more States, or to be constructed in one State for the benefit of another State, or (E) As to the diversion of water in one State for the benefit of another State: The governors of the States affected, upon the request of one of them, shall forthwith appoint commissioners with power to consider and adjust such claim or controversy, subject to ratification by the legislatures of the States so affected.

Nothing herein contained shall prevent the adjustment of any such claim or controversy by any present method or direct future legislature action of the interested States.

**Article VII.** Nothing in this compact shall be construed as affecting the obligations of the United States of America to Indian Tribes.

**Article VIII.** Present perfected rights to the beneficial use of waters of the Colorado River system are unimpaired by this compact. Whenever storage capacity of 5,000,000 acre-ft. shall have been provided on the main Colorado River within or for the benefit of the Lower Basin, then claims of such rights, if any, by appropriators or users of water in the Lower Basin against appropriators or users of water in the Upper Basin shall attach to and be satisfied from water that may be stored not in conflict with Article III. All other rights to beneficial use of waters of the Colorado River system shall be satisfied solely from the water apportioned to that Basin in which they are situated.

**Article IX.** Nothing in this compact shall be construed to limit or prevent any State from instituting or maintaining any action or proceeding, legal or equitable, for the protection of any right under this compact or the enforcement of any of its provisions.

**Article X.** This compact may be terminated at any time by the unanimous agreement of the signatory States. In the event of such termination all rights established under it shall continue unimpaired.

**Article XI.** The compact shall become binding and obligatory when it shall have been approved by the legislatures of each of the signatory States and by the Congress of the United States. Notice of approval by the legislatures shall be given by the Governor of such signatory State to the Governors of the other signatory States and to the President of the United States, and the President of the United States is requested to give notice to the Governors of the signatory States of approval by the Congress of the United States.

In an address before the San Francisco Chamber of Commerce on Nov. 29 and again before the Commonwealth Club of the same city on Dec. 1, Secretary Hoover stated that the development of the Colorado River would make possible the irrigation of 4,000,000 acres of land, bringing the total acreage benefited by its waters up to 6,500,000, and incidentally develop 4,000,000 hp. of electrical energy, or more than twice the amount available in the whole Sierras. There is thus an asset to be added to the nation in agricultural area larger than the state of Maryland and capable of supporting 3,000,000 people. At the same time the fertile valleys of Arizona and California jeopardized each year by the rush of waters occasioned by melting snows, would be protected from floods.

Secretary Hoover said further:

"It should add 2,000,000 acres of fertile land to California and Arizona and as an incident, present these states with nearly 1,000,000 horsepower. If, during the century to come, even more water can be availed of, another great site for a dam exists at Glen Canyon, where almost a similar sum of water can be secured and thus it would be possible to save every drop of water from the high flows of certain years to the shorter years of lesser rainfall, until the day will come when every drop of the Colorado River can be spread over the land. It is therefore the view of the commission that the next step to be taken is the erection of sufficient of this dam to comprise safety from floods and to give storage for another million acres of land—and I earnestly recommend it to your support."

# DISCUSSION

## W. L. Goodwin Presents Views on Retailing of Electrical Merchandise

To the Editor:

Sir: I have read with much interest the editorial in the Nov. 1 issue of the Journal of Electricity and Western Industry, entitled "Evolution of Merchandising of Electrical Appliances."

If you will permit me to express an opinion, may I call your attention to the fact that if the electrical industry is going to succeed over a long period we should ever strive to make our retail service a complete operation. I believe that the proper sale of electricity and its various products will never be done in the right decent way, commensurate with the importance, responsibility and dignity of the industry, until we offer to the public from electrical shops as nearly as possible the complete electrical service.

Granting that the present order of things does not permit of the successful conduct of a combination merchandising, contracting and servicing operation, it is no reason why we should not strive for that end. I quite agree that the man possessing the combined talents of a contractor and a merchandiser is rare. Perhaps in the final analysis the successful retailer will be represented by several personalities making up the combination of a successful business entity.

Obviously, there are many obstacles to overcome. Margins commensurate with proper capital investment and set-up are one of these requirements and this whole question is gradually but surely being solved.

From my observations over the country I would say that your editorial reflects a situation which prevails mainly in the large centers. Here, undoubtedly, we find a momentary necessity for the segregation or specialization of the several units of the business, but after all is this not procrastination? If we view the situation in many of the large cities we find the contracting business getting worse instead of better. Competition and methods are becoming almost unbearable and there is not much to be hoped for in a bright future for the contractor. If it were possible to survey the country we would probably find that as many failures were recorded among exclusive contractors as among the combination of contractors and dealers and likewise as many failures among the exclusive dealers as among the contractor-dealers.

I wish it were possible for the Society for Electrical Development to conduct a nation-wide survey to determine the facts and establish clearly the underlying causes, but we are not financially in a position to make such an extensive survey. Perhaps the time will come when we will be able to do this.

The whole thought I have in mind in writing you is that we should look far enough into the future and conduct a course of development in the industry along sound lines and be ever mindful of the industry rendering the kind of service that the public expects to receive from electrical people. By and large they cannot get the service which they demand from either central stations, contractors or dealers. There are a few exceptional cases where a combination service is offered. I think there have been entirely too many arguments presented as to what the electrical industry should do in this or that case based on what has been done in other merchandising lines. The parallel does not exist, in my estimation. What they are doing in department stores, in the specialized industries of clothing, shoes, etc., is not a criterion for the electrical industry to follow. These specialized industries have existed for generations. Most of the merchandising operations of these institutions, as reflected in the daily advertisements of the bigger and better merchants, are nothing more nor less than a public announcement of certain wares at certain prices. A white goods sale on Monday does not involve any educational features. Women respond because they know almost by instinct all of the factors involved in the purchase of white goods. A similar announcement covering our most important product would fall almost on deaf ears; first, because only a small part of the community is interested in our proposition and second, because we have a long period of educational work before us before we can hope to find the electrical industry merchandising upon lines and with goods that are fully understood by the public.

Notwithstanding the momentary difficulties that we encounter in the complete and combined service and even conceding that there will always be a field for the specialist, be he contractor, jobber or dealer, should we not, at least in the editorial columns, constantly keep before the industry the necessity for developing our business along lines which will ultimately give to the public the right kind of service and at the same time offer profit and reward for men of ability with proper capital to succeed? There are many faults in the present situation. Human deficiencies, such as the combined talents of a merchant and a contractor, are but one of these deficiencies. The lack of understanding on the part of the public, the code, insufficient margins, the necessity of the contractor dealing through second or even third parties are all contributing factors.

Nothing has happened during the past several years which has caused me to change the opinion I held many years ago, namely, that we should continually strive towards the combined service operation. Whether this service will be performed exclusively by public utility companies, by contractor-dealers or by a combination of all, time alone will tell, but if we study other lines of industry we should have no

difficulty in arriving at the conclusion that the complete service is necessary if electrical companies are to survive in our highly competitive commercial structure.

WM. L. GOODWIN,
Assistant to the President,
The Society for Electrical Development, Inc.
New York, N. Y., Nov. 17, 1922.

## Objects of Joint Committee for Business Development Are Announced

To the Editor:

Sir: The Joint Committee for Business Development has reached the turning point and is ready now to go "full speed" ahead, as is evidenced by the statement regarding the objects and organization of the body. The Joint Committee is organized as a permanent institution and its activities are not in the nature of a campaign. The statement, recently authorized, is a commitment, not only to the electrical industry but to the public, of the platform upon which the organization will operate.

The objects of the Joint Committee for Business Development are to stimulate and increase the use of electricity for every purpose, formulating ideas and developing plans which will be placed in the proper affiliated agency for execution.

The slogan "Electrify" has been adopted as its message to the trade and the slogan "Do It Electrically" as its message to the public.

The Joint Committee for Business Development stands in a unique position as an advisory commercial agency for the whole electrical industry. Representation on the Joint Committee from all branches of the industry makes it possible to harmonize and consolidate the electrical development movement, bringing together various minds on any commercial idea or problem that might be presented. A majority opinion of such an organization should represent the general viewpoint of the industry and will result in a concerted movement by each of its agencies, and a more effective and rapid development obtained than has heretofore been possible.

Through its affiliation with allied associations, each of which has representation, the Joint Committee can receive from them suggestions as to what may be accomplished by joint action in furthering the work in their particular fields.

The Society for Electrical Development will operate under the general direction of the Joint Committee for Business Development or its executive committee, insofar as work affecting the program of the Joint Committee for Business Development is concerned.

The Joint Committee, having access to valuable information, will be in a position where ideas and plans can be developed. After development such plans will be put into practical form by the proper agency affiliated with the Joint Committee, either in the form of circulars, literature or statistical data which will be sent to its correspondents throughout the country.

The forming of local committees of three men or more, usually a contractor, dealer, jobber and central station man, is one of the first tasks of the Joint Committee, and considerable has been done in this direction.

These local bodies are asked to elect one of their members to be the contact man of the Joint Committee. To him will be sent such information as the committee prepares from time to time, and he in turn after consultation with his associates can put the information and service rendered by the Joint Committee to practical use where it applies to the local situation.

The enlarging of such local committees to clubs or leagues is desirable and is part of the program, and plans for accomplishing this result will be available through the Society for Electrical Development when wanted.

It is obvious that the stimulation of business can be carried out more rapidly by local effort properly organized and that such efforts must not be spasmodic but will be much more effective if carried on continuously.

Manufacturers, jobbers, dealers, contractors, central stations, or others engaged in the electrical business should suggest definite plans or activities to the Joint Committee for consideration.

A study of the literature and data already available and which is intended for general use, issued by the various associations and companies, is being made to the end that it be placed before a larger audience.

It must be obvious that electricity cannot be used without some sort of appliance, therefore anything that can be done to increase the sale of electrical devices will accomplish the purpose. If more devices are sold it means more wiring, more supplies and more electricity to be furnished. Stimulating the sale of merchandise stands out as a big work to be accomplished.

The Joint Committee for Business Development comprises representatives of contractors, dealers, jobbers, manufacturers and central station organizations including:

Association of Electragists—International;
Canadian Electrical Association;
Electrical Manufacturers' Council (Associated Manufacturers of Electrical Supplies, Electrical Manufacturers' Club and Electric Power Club);
Electrical Supply Jobbers' Association;
Fixture Dealers Society of America;
Illuminating Glassware Guild;
National Council Lighting Fixture Manufacturers;
National Electric Light Association;
The Society for Electrical Development.

The Joint Committee for Business Development is organized with an executive committee and a headquarters staff and includes six departments: Domestic and Industrial Appliances, Electric Lighting, Electric Power, Electrical Transportation, Industrial Heating and Melting, and Wiring; and three general committees: Advertising Committee, Allied Industries Committee, and Press Committee.

The formulation of local committees with one man as committee correspondent has been started. In cities where there are electrical leagues or clubs the secretary or other authorized person will be the correspondent. In the case of local, state, district and national associations, there will be additional channels through which information and suggestions will be distributed.

E. W. LLOYD, General Chairman,
Joint Committee for Business Development.
New York, N. Y. Nov. 22, 1922.

A QUARTER of a million people visited electrical homes in the West during 1922. It is proposed to tell the electrical home story to twice this number next year. It is pleasing to note that the success of the idea has been so remarkable that groups outside of the industry are now adopting the plan. An example is shown here in the Better Homes Exhibition at Lakeside Highlands, Oakland, California.

# Alhambra's Electrical Home

By George C. Tenney

*HOW R. E. Heerman, enterprising electragist of Alhambra, Calif., staged a highly successful electric home and increased his business $1000 per month at a total cost of $148.50.*

NOAH did not wait for the rest of the community to back him up in the construction of the ark. If he had, undoubtedly the rising flood would have caught the leading citizens of Babylon holding their fifteenth organization meeting and get-together dinner with the ark unbuilt and the question of Noah's qualifications for the captaincy of the vessel still unsettled. Let the enterprising contractor-dealer who senses the rising flood of prosperity and realizes the potency of the home electrical as a means of increasing his business, pattern his steps after Noah, stage an electric home exhibition himself, and be on the boat when the flood hits his town. It can be done.

It is doubtful if R. E. Heerman, president and manager of the S. & H. Service Electric Company, Inc., of Alhambra, Calif., gave the biblical Noah a thought when he visited the Adobe Electric Home in Los Angeles two years ago, but he came away with an idea. Alhambra is a small town—principally residential—with a population of 14,000, but it was growing rapidly. There was a cloud on the horizon, one of those clouds with a silver lining, for boom times were coming. Mr. Heerman did not require a heaven-sent vision to enable him to see the possibilities of an electric home in such a community, nor to see the effect such an exhibition would have upon the sale of appliances and the wiring contracts he might secure. There is a message for every contractor-dealer in the story of how he staged the home and the benefits which are derived in the way of increased business.

To get back to the idea which Mr. Heerman brought away from the Los Angeles Electric Home. Such an exhibition in his community, he believed, would give his store direct personal contact with at least 5,000 people at a small cost. The display would be realistic and consequently more effective in telling the story of the service which his establishment was ready to render to the community. It would cost less than newspaper advertising for it would reach more prospective customers and it would carry with it an immense amount of publicity which could be secured in no other manner.

With this in mind, he began his plans. His proposals to the electrical industry aroused some interest. Yes, an electric home would undoubtedly be of value, but think of the organization work, the money and the energy required to stage such an exhibition. This reception necessitated a change in his plans. He sought out A. A. Tennyson, who was as enterprising a contractor and builder as Mr. Heerman was an electragist. The builder immediately saw the potential advertising value of an electrical home to his own business, and offered to cooperate in the construction of the dwelling. The task was then half finished.

Where to build the home? The real estate dealer who was approached did not require a battery of economic experts to show him where he would benefit. He had to spend plenty of money anyway to get prospective purchasers to his newest subdivision and here were two men who offered to make the task easy for him at half the cost. Moreover, he was planning to subdivide an orange grove on the edge of the town, making it an exclusive residential

The bed room with the appliances in the proper location

tract. The electrical home would form a splendid basis for the publicity and advertising campaign which would be launched by the real estate dealer at the opening of the tract.

When the plans for the home started to take shape, they went forward with a rush. At this stage the electric home was to be built by A. A. Tennyson in a subdivision to be opened by J. Homer Hough & Company and it was to be completely electrified by the S. & H. Service Electric Company. An architect, Scott Quintan, was secured to draw the plans, Mr. Heerman supervising the electrical details. When the plans were ready, Alhambra merchants were interviewed. The Campbell Music Company offered to install the electric piano and phonograph; the Home Furniture Company would furnish the house; the Alhambra Hardware Company would supply the hardware; the Alhambra Cabinet Company, the cedar chests and cabinets, and Gorrell & Sons would do the painting and decorating.

The home exhibition was now ready to launch. To date, the cost to Mr. Heerman was exactly nothing, if the time which was required to secure the cooperation of the various merchants is not included.

It was decided that each merchant should advertise his participation in the home as he saw fit, and that there would be no central advertising fund. In the end this proved most effective. The only cooperative advertising that was done was the securing of a cut illustrating the home, which was printed on the stationery of those participating in the exhibition during the time the home was displayed.

By mutual agreement, the publicity and advertising campaign was launched immediately preceding the opening of the home for display. Favorable comment was aroused and publicity secured in both the local and the Los Angeles papers. No committees were required to secure this publicity as in each case the editors of the papers realized the news value of the electric home story.

The wiring of the home was done by the S. & H. Service Electric Company although bids for the work were called by the builder and that company's bid was $50 high. The job was secured on a quality basis. The fixtures which were installed were taken from stock and the larger appliances secured from the electrical jobbers on consignment. Only such appliances as could actually be used by the housewife were displayed and they were placed in their proper locations.

Before the exhibition there was some doubt as to the advisability of the S. & H. Service Electric Company maintaining a demonstrator at the home each afternoon and evening while the home was on display. Consequently a series of cards were prepared, telling the story of each appliance or explaining the various features of the wiring. These cards were advantageously placed. The cards were large and bore the name and trademark of the company. That in the bedroom said:

**NOTE!**
**Rozelle Glassware**
**Electric Curling Iron**
**Electric Hairdryer**
**Electric Vibrator**

Another which was posted on the side of the garage beneath the meter box follows:

**NOTE**
**Meter on Side of Garage**
**No Meter on Porch**
**No Wires to House**

Each convenience outlet was plainly placarded and almost every appliance had attention directed to it by means of a sign.

Previous to the opening of the home the S. & H. Service Electric Company ran a series of advertisements in the local paper, calling attention to the home and its opening date. All those connected with the exhibition did likewise. Invitations were sent out by Mr. Heerman on the electric home stationery to everyone on his prospect list, which included 5,000 names. The text of the invitation, which was printed in display type, follows:

"You are most cordially invited by the S. & H. Service Electric Company, Inc., Alhambra's progressive electrical dealer, to inspect the Model Electrical Home at 1000 South El Molino Street, Alhambra. Open afternoons and evenings commencing Tuesday, Sept. 12, 1922.

"The Model Home has been built and completely furnished, including all modern electrical appliances, by local artisans with materials supplied by local merchants. All electrical work, electrical appliances and fixtures furnished and installed by S. & H. Service Electric Company, Inc."

When the home opened, one of the sales solicitors employed by the contractor-dealer was on the premises to conduct visitors through the home and to explain the electrical features. It was planned to do this only on the first few days of the display. However, the salesmen, who are employed on a commission basis, secured so many prospects and sold such a quantity of appliances while at the home, that there was no time when a guide was not available. The sales made on the floor of the home during the time it was open for public inspection, were approximately $2,300.

By means of a register which visitors were asked to sign. Mr. Heerman secured 2,500 new prospects for his mailing lists. These names will be segregated and solicitors will follow them up with regular calls at a later date.

The home was visited by more than 5,000 people. The total cost to the S. & H. Service Electric Company for telling its story to these people was $148.50, or less than three cents per visitor. This was segregated as follows:

| | |
|---|---|
| Signs and lighting | $17.00 |
| Photographs and cuts | 17.50 |
| Newspaper advertising | 45.00 |
| Circulars and stamps | 47.00 |
| Miscellaneous | 22.00 |
| | $148.50 |

No estimate of the value of the time of Mr. Heerman spent in promoting the display can be made. It is needless to say that he has been amply repaid.

For the contractor who is planning to exhibit a home under similar circumstances, an estimate of the amount of business which he might expect is as desirable as an estimate of the amount of money he will have to expend in staging the display. It has been stated that salesmen of the S. & H. Service Electric Company took orders for approximately $2,300 worth of appliances and fixtures on the floor of the home while it was being displayed.

This dining room fixture brought a dozen orders for similar fixtures. Note the judicious use of signs calling attention to the electrical feature.

The first indication of business at the Alhambra store which was directly traceable to the home was in fixtures. For some months there had been on the shelves a considerable stock of dining room fixtures, one of which was used in the dining room of the electric home. Inquiries about these fixtures began immediately after the home was opened. Within two weeks after the exhibition closed, the entire stock of the fixtures was sold out and more had to be ordered.

Three important adjuncts to the electric home, the sewing machine, the vacuum cleaner and the ironer

The following comparison of sales for September and October, 1922, the months during which the home was displayed, with the same months in 1921, best shows the amount of business which the exhibition brought.

| Month | 1921 | 1922 |
|---|---|---|
| September | $4,200.50 | $7,869.78 |
| October | 4,050.65 | 9,050.66 |

Mr. Heerman is conservative, for he estimates that but 25 per cent of the increase shown above is directly traceable to the electric home. He attributes the remainder to natural business growth and better merchandising methods. He is sure, however, that the electric home has increased his business approximately $1,000 per month and that its effect will be felt for at least a year.

In addition to the above, the company has secured 25 wiring contracts since the display closed, due directly to the home. Every one of these jobs has been secured on a quality basis. In one instance the company's bid was $125 higher than the lowest bid, yet the job was secured. Every one of the 25 jobs has been obtained in the face of ruinous competition from curbstone contractors. A contract which will approximate $3,000 has also been signed calling for the wiring of a home even more completely than the electric home was wired. This home will contain 14 electric steam radiators, two electric water heaters, an electric range, and a large number of appliances.

Results such as those obtained by Mr. Heerman are within the reach of every contractor-dealer who believes that service is the basic policy of good business. Service, quality and sound merchandising principles backed by energy and enterprise spell

A Model Home For Mr A A Tennyson
• J. Homer Hough Company •
• Realtors • Alhambra •
"An Ideal Electrical Home in 'Alhambra, Where Life's Worth While.

This cut of the home was imprinted upon the stationery of all merchants who participated in the exhibition

success for the electragist as well as for any other merchant.

The electrical contractor-dealer who is obsessed with the idea that an electric home is a thing which requires large expenditures of money and time, and one from which he will receive no benefits, should profit from the experience of Mr. Heerman. There are numbers of Alhambras in the West and there is an enterprising electragist in each one of them. Let them take a tip from Noah and launch an electrical home of their own. R. E. Heerman did. It worked out so well that he is already planning the Second Alhambra Electric Home to be displayed within a year.

## ELECTRIFICATION OF SWISS RAILROAD

Not many, if any, persons can remember the epochal transformation of Alpine travel when railway tunnels between Italy and Switzerland were substituted for the time-honored stage coaches going over the top; but that improvement was hardly less important nor more appreciated by travelers than the electrification of the Gotthard line, now completed and in operation, according to a report from Consul General James J. Murphy.

In the light of experience with electrification up to the present time, the installation, from a technical point of view, is entirely successful. The movement of trains is just as regular as steam locomotives; the passengers and the railroad personnel appreciate highly the elimination of smoke; and there is no doubt but this is an important step forward, hygienically.

The attractive electrical home of A. E. Wishon, in Fresno, California

# The Electrical Home for the Electrical Man

By Norman S. Gallison

ONE of the severest indictments against the electrical man is that, in the use of domestic devices, he does not practice what he preaches. Investigations show that the percentage of electrical appliances in the homes of electrical men is no greater than in the homes of non-electrical men. One investigation of 6,700 homes showed that out of this group of people whose business it is to sell electric service in the home only about twenty per cent use any of the appliances except the electric iron.

"Selling the Electrical Idea to the Electrical Man" is a constructive piece of work which could well occupy the attention of the various organizations within the industry now designed to educate the public to the many advantages of electricity in the home. There is a general criticism, and a just one, that one branch of the industry often stands in the way of the other. Examples are not unknown of electrical men "knocking" various appliances such as heaters, ranges, and water heaters. Individual organizations could well afford to do missionary work among their own employees to stimulate the increased use of appliances.

Stimulation of the use of electrical appliances by electrical men is today one of the greatest undeveloped resources of the industry. Electrical homes of electrical men represent not only examples pointed to and emulated by the community, but they augur well for the owners' part in forwarding the industry.

One central station manager who believes in the electrical home idea so thoroughly that he owns one himself is A. E. Wishon, general manager of the San Joaquin Light & Power Corporation in Fresno, Calif. His home, views of which are shown here, contains 263 electrical outlets—and almost every species of electrical appliance known to man. Perhaps because of the support which the central station gives to the electrical idea by thus showing that they believe in it, Fresno not only has had its electrical home, but it has an electrical home district, where the general contractor builds nothing but houses which are fully equipped with convenience outlets and modern wiring.

The main sitting room in the Wishon home, shown on the following page, has 16 outlets, including the master burglar switch which is found in every room and which controls one light in every part of the house. A fine variety of lighting effects is obtainable in this room, where portable lamps and wall brackets may be separately controlled. Note the movable electric fixtures on the mantel-piece which may be shifted to vary the effect, or removed entirely for purposes of cleaning.

Although the tradition of the wood fire has been kept for the sake of its winter beauty, electrical heaters are provided for the practical heating of the house. In the dining room, a toaster, a percolator and a waffle iron help to make an electrical breakfast. Center outlets, so that connection may be made under the edge of the table, provide for convenience in the operation of table equipment. The fixtures for each room were especially designed to fit into the scheme of decoration and both shades and metal work tone in with the coloring of wall paper and woodwork.

Main sitting room and corner of bed room in Wishon home

An electric range, a dish washing machine and a complete outlay of electrical equipment make the kitchen a pleasant place to work, even in the hot weather of summer which helps to ripen that raisin crop for which the country in the vicinity of Fresno is so famous. The pull switch for the light which is installed directly over the electric range is seen below the hood. A small ventilating fan in the ceiling of the hood draws off all odors of cooking and any heat which may be radiated from the kettles themselves.

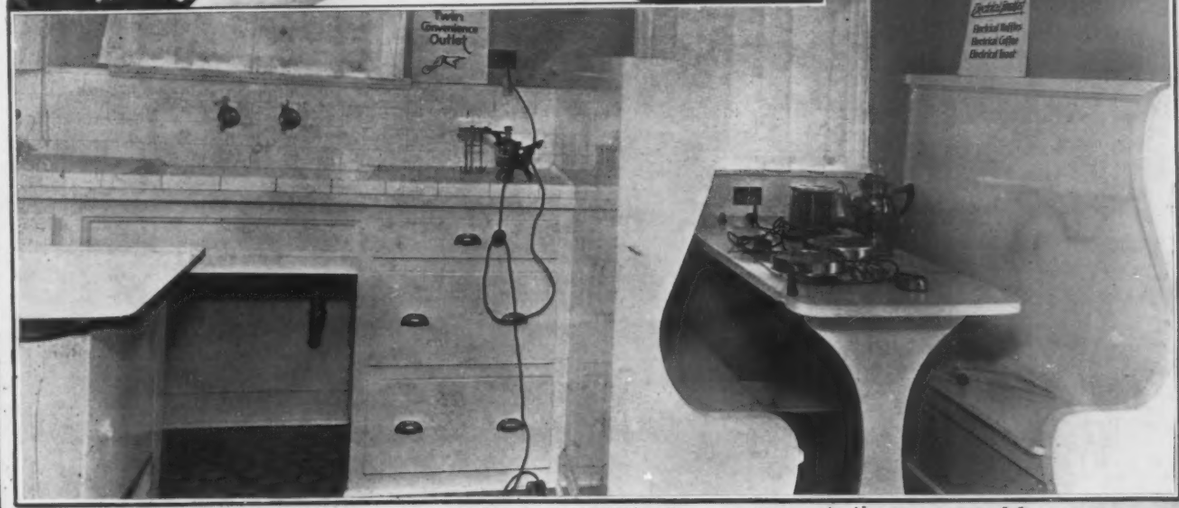
Washing machine and electric ironer are conveniently situated on the laundry porch. Convenience outlets are at hand for all needs. Outlets are situated some fourteen inches above the floor rather than at the floor level, as a more convenient height for the housewife. An electric motor operates the sewing machine. Electric fixtures are placed considerably lower on the wall in the Wishon home than is the usual custom. They are located about 4 ft. 6 in. from the floor, or, where the light is required at table height, the bracket is even lower.

Switches at each major entrance, convenience outlets near the bed and bureaus, the convenient electric heater and all such other equipment as go to make a bedroom comfortable are found here. A burglar switch in this case is located where it may be reached from the bed. Wall brackets are placed low on either side of the bureau, giving better light without casting shadows. All metal of the fixtures and of the switch plates is especially toned down to fit in with the coloring of the room.

Mr. Wishon has equipped his tennis court with flood lights, making possible the enjoyment of the game in the evening. This adds considerably to the pleasure of the sport, especially in the summer. The switch for the tennis court lights is located in the house near the main switch and fuse panel. Needless to say each fuse on the panel is plainly marked and directions show which rooms are involved.

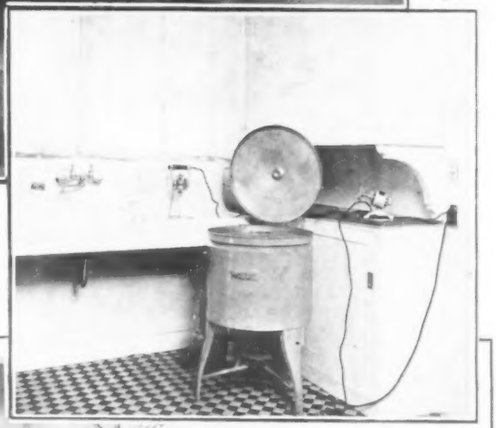
Kitchen and dining room have the latest in electrical conveniences

# ELECTRIC HOMES TELL STORY OF MODERN HOUSEHOLD SERVANTS




Five thousand people of Alhambra visited the home shown in the upper and lower pictures. In the center is the bed-room of the Denver home.

Mt. Baker Home, Seattle, above. Oakland Home Kitchen at right and below

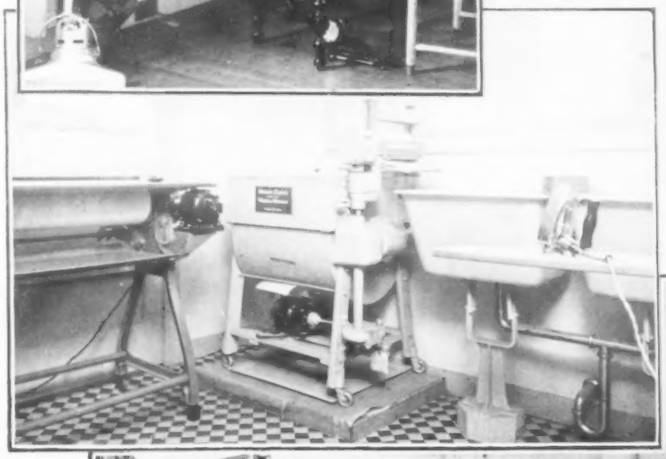


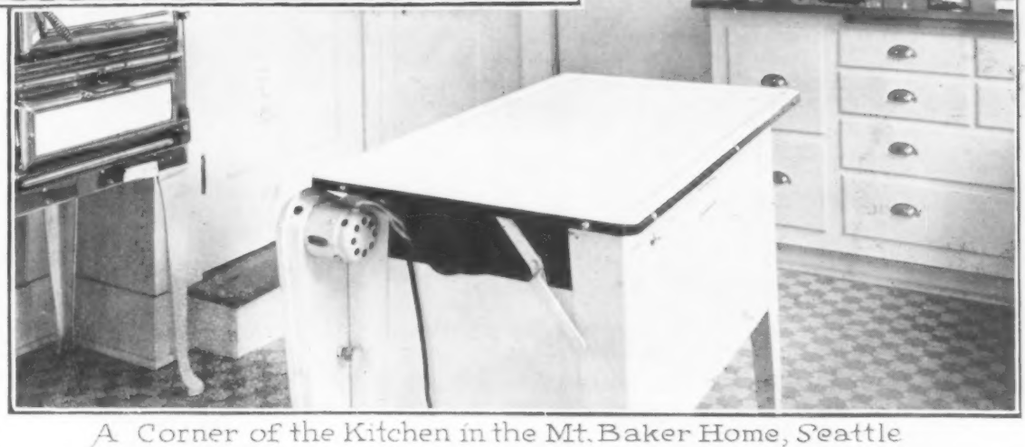
The Dining Room of the Oakland Home

Even a Radio Set in the Living Room of the Mt. Baker Home, Seattle

Above, Dining Room, Mt. Baker Home. Sewing Room and Laundry of Oakland Home at left and below

Electric Fire-place in the Oakland Home





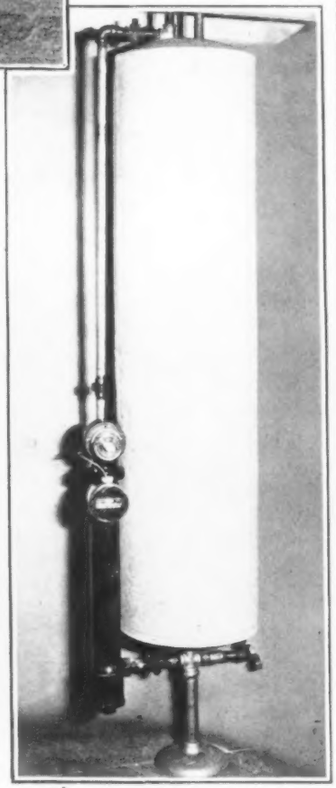
A Corner of the Kitchen in the Mt. Baker Home, Seattle

The North Broadway Home, one of two homes displayed simultaneously in Seattle.

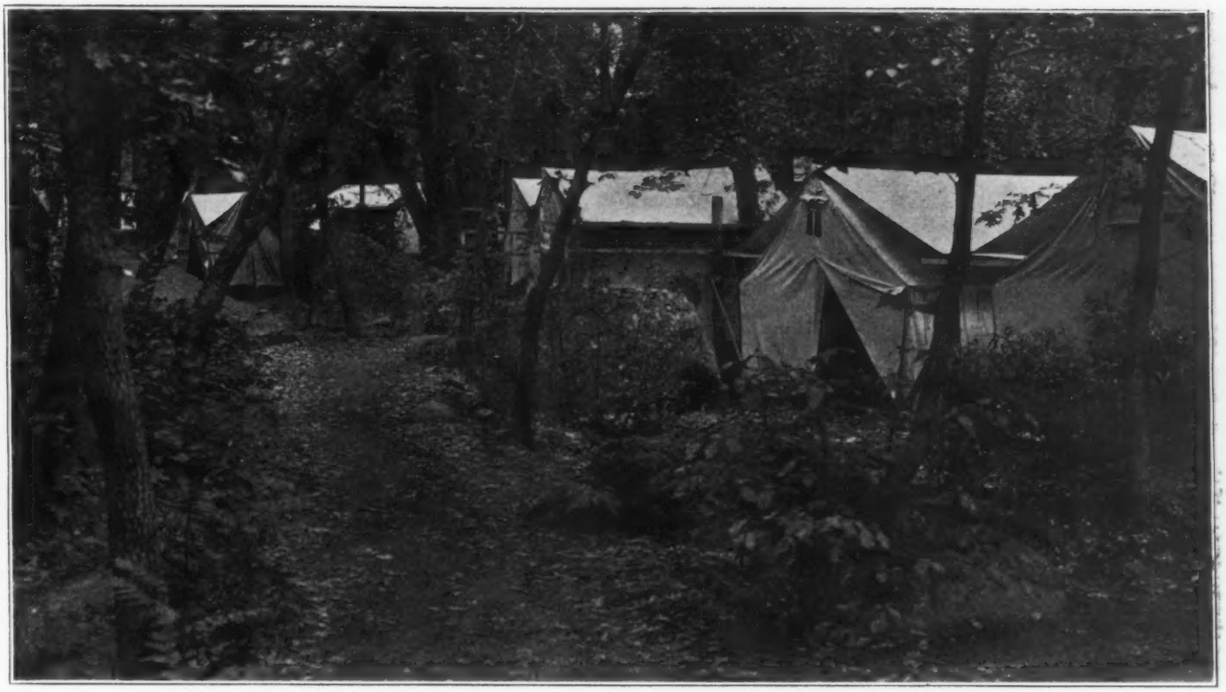
The Electric Home at the Oakland Better Homes Exposition

The Den or Sewing Room in the Denver Home

The Living Room in the Vancouver Electric Home, featuring proper illumination



The water heater in the home of A. E. Wishon, Fresno.



Electric lights gleam at night from the picturesque tents at Camp Curry

# Modern Electrical Conveniences in a Mountain Camp

By Charles Mathews

*THE comfort and convenience of doing it electrically is demonstrated to thousands of tourists who visit Camp Curry in Yosemite Valley. Here electricity performs every domestic task to which it can be applied.*

SCARCITY of fuel and the abundance of energy in the snow fed, roaring streams dictated experimental electrical installations in Camp Curry, the well known resort in the world famed Yosemite Valley. Such satisfaction has been obtained that today, practically every operation to which electricity can be applied is being performed by electricity. Power is supplied by the Department of the Interior at reasonable rates. Indeed, without the government power plant opened in 1918, at a point about 6 miles below the Yosemite Valley proper, the Park would still be without its many luxuries. This plant has a capacity of 2,400 kw. with a present output of 1,000 kw. entirely adequate to meet present as well as prospective demands. The timber-faced, log-cut dam of the project contains a concrete diverting chamber with grizzlies, wasteway and intake. A wood stave pipe about 5,300 ft. long carries the water to a 42-in. steel pipe 800 ft. in length, thence to the power house where it is delivered under a 336-ft. head. The capacity of the penstock is 93 sec.-ft., but for the generation of 1,000 kw. only half of the amount is utilized. The power is generated by two 1,250-kw., 2,300-volt, 60-cycle General Electric generators running at 750 r.p.m. and direct connected to two Pelton Francis turbines. The exciters are direct connected and are rated at 10 kw., 125 volts. Three 400-kw. oil-cooled transformers step the voltage up to 11,000 for transmission over a distance of 8 miles to Yosemite proper. The power plant is of all concrete construction and cost $212,000.

To give an idea of the amount of energy required it may be stated that the load for cooking in 1921 at Camp Curry amounted to 150 kw. One large oil range was supplanted by three 22-kw. Hughes hotel type electric ranges. There is also in the kitchen a 3-kw. hotel type toaster and an electric motor driven toaster. This toaster is a great convenience and will turn out 1,700 slices of toast per hour at a cost of three cents per hour for electricity. In addition to the ranges and toaster there has been installed a Hughes No. 300, 25-kw., 220-volt bake oven which meets the demands of 1,000 to 1,500 people per meal. The electric oven has replaced an old brick

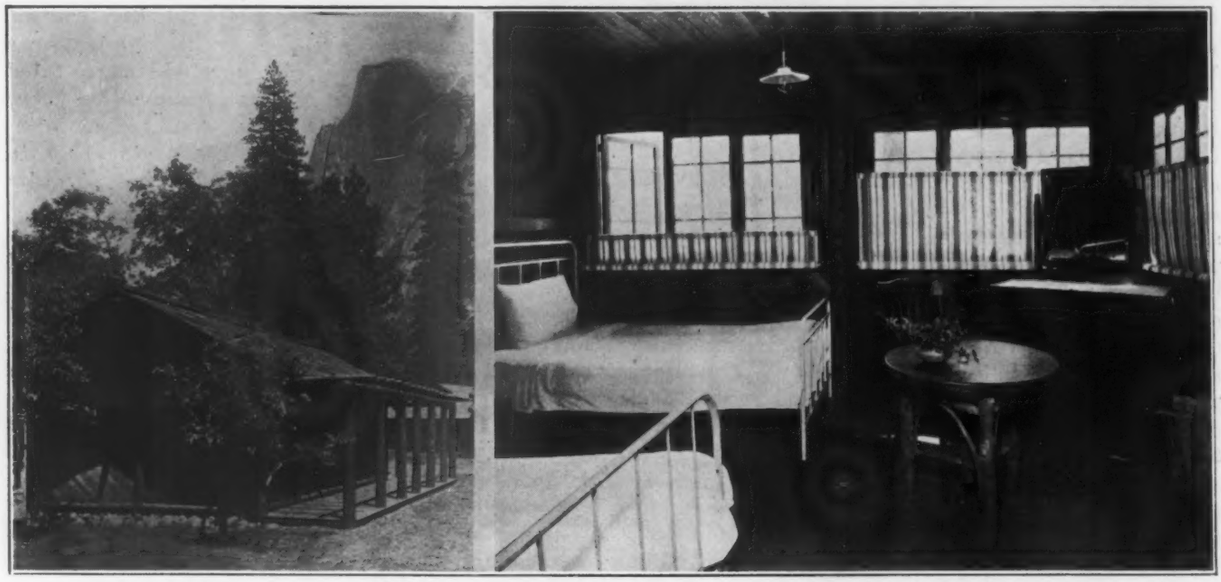
Employees' cafeteria, erected in 1922 and equipped with electric range and grill

oven in which wood was used as fuel and which took 24 hours to heat to 400 deg. With the new oven the switches are all turned to high for 4 hours to get a temperature of 550 deg. In connection with the bake oven there has been installed an electric dough mixer which greatly lessens the labor of baking.

Included in the equipment of the camp are conveniences for supplying the guests with a variety of frozen delicacies. The camp maintains an electrically operated ice plant of 2-ton capacity driven by a 20-hp., 3-phase, 220-volt, General Electric motor. In addition there has been installed a Miller ice cream freezer which freezes 10 gal. of ice cream in 15 minutes. Seventy-five gallons of ice cream are consumed each day.

All dishes and silverware are cleaned and sterilized by three Peerless electric dishwashers. Another great convenience in the camp kitchen is a six-compartment Duparquet electric egg cooker which takes care of hundreds of eggs required by the guests in the course of a day. For the purpose of supplying coffee to 350 employees of the camp there is a 6-kw. coffee percolator which completes percolation in 35 minutes.

The laundry which takes care of the entire camp, including the personal laundry of the campers,



Exterior and interior of rustic cabins in the shadow of Half Dome, heated and lighted by electricity

is electrically equipped with 12 ironers, also an electric shaping machine for collars.

Since the camp requires much lumber for the construction of additional bungalows and other new buildings it maintains its own sawmill for turning out finished lumber. This is operated by a 20-hp., 3-phase, 220-volt, General Electric motor.

**Electrical Equipment in Bungalows and Tents**

Safety and protection from fire is at its highest efficiency in Camp Curry. There is a fire alarm system which extends to all parts of the camp. Employees are well drilled for fighting fire and the water mains carry water from a practically inexhaustible source. The necessity for the complete safety given by this system will be better understood when it is pointed out that the occupants of the camp are in a state of relaxation. They find occasion to use matches while smoking—always a source of danger despite the utmost precaution. With a fire fighting system as complete as that at Camp Curry there is never a cause for fear from that source.

At the present time there are thirty rustic bungalows, each equipped with a 3,000-watt, 220-volt water heater connected to a 60-gal. tank. When tank water has reached 160 deg. the electricity is automatically turned off until the temperature falls below that point.

The average monthly consumption of electrical energy is as follows:

| | | | | | | |
|---|---|---|---|---|---|---|
| Light | 15,000 | kw-hr. | at | $0.06 | per | kw-hr. |
| Heat | 60,000 | " | " | 0.005 | " | " |
| Cooking | 50,000 | " | " | 0.008 | " | " |
| Power | 12,500 | " | " | 0.04 | " | " |

The bungalows each have two rooms and in the spring and late fall are heated very satisfactorily with 1,000-watt air heaters. All electrical heating equipment in the bungalows is for 220 volts. The total load is 120 kw. In addition to the bungalows there are are sixty tents which are lighted and heated. The total load for heating these is 60 kw.

The general electrification of Camp Curry is made possible because of the small cost of electricity. The rates are six cents per kw-hr. for lighting, four cents per kw-hr. for power, eight-tenths of a cent per kw-hr. for cooking and five-tenths of a cent per kw-hr. for water heating.

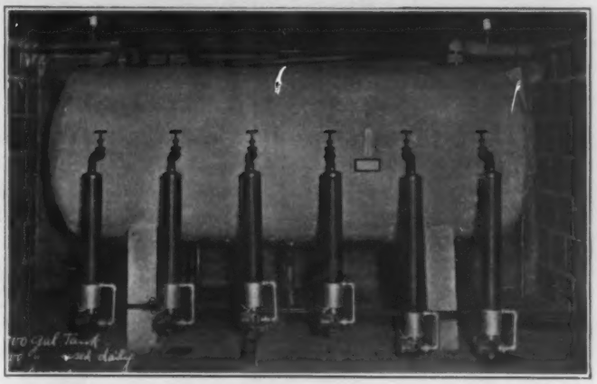
The total number of meals cooked on electric ranges for the month of June, 1922, was 120,000. The average cost per meal was 1¼ cents per person.

**Electrical Equipment Installed in 1922**

During 1922 electric lights were installed in 650 tents. The wiring of this number of tents was by no means an easy task on account of the necessity of running in the rear of the tents to hide wires as much as possible; 12,000 ft. of drop cord, 40,000 ft. of No. 12 weatherproof wire, and 1,200 fuse plugs being used. Each tent is equipped with a fuse block using two 6-amp. fuses. In addition, two heavy duty hotel type ranges, one No. 300 Hughes bake oven, and one 6-kw. egg poacher were installed.

A concrete service building in which is found an electrically equipped help's cafeteria, which feeds 350 employees, was also constructed. The equipment consists of two 22-kw. heavy duty Hughes ranges, one 9-kw. griddle and one 6-kw. coffee percolator. On the same floor is the new up-to-date bakery consisting of two 25-kw., 220-volt Hughes bake ovens and two proofing ovens, in which are installed two special Hughes 1,500-watt heaters, also an up-to-date dough mixer and sifter.

Next to the bakery is a storehouse which is connected to the basement and third floor by a new 2-ton Otis freight elevator. Adjoining the storehouse is a candy factory which is electrically operated. In the basement of the service building a 14-ton Vulcan ice plant is driven by two 20-hp., 3-phase motors . Camp Curry sells ice to the campers, but uses the greater portion for camp consumption in ice and refrigeration.



Showing the method of heating water in 1,000-gallon tank. The connected load is 32 kw. Four thousand gallons are used daily.

There are at present under construction twenty-two rustic two-room bungalows, each to be equipped with a 3,000-watt Wesix water heater connected to two 30-gal. tanks for hot water and baths. A novel idea has been worked out which will be of great help in the late fall and early spring for air heating by hot water radiator system. The Department of the Interior, which controls the power supply, would not allow the installation of additional air heaters on account of the terrific peak load which would occur during the cold spell. To obviate this difficulty, two galvanized iron radiators, one in each room, are connected to a 30-gal. tank. This not only gives a 60-gal. storage, which the government demands as a storage basis, but also gives even distribution of heat. When the cold spell is over, the radiators are closed and the valve on the extra tank is opened, the 60 gal. demanded by the government being maintained. The temperature in the rooms is 75 deg. when the weather on the outside is 48 deg. This temperature can be obtained in three hours from cold water temperature. The approximate cost per day for electrically heating water is 12 cents. The cost to heat bungalows with hot water radiators, including water heating, averages 25 cents per day. These tests were taken by a General Electric recording ammeter with a current ratio of 15 to 1 under actual working conditions.

# ELECTRICITY IN INDUSTRY

By Louis F. Leurey
Industrial Electrical Engineer

## The Indoor Drying of California Fruits Eliminates Weather Hazard

IF HE is to become successful the farmer is coming to realize that he must, as far as is economically possible, remove the many hazards that now make his business one of the most widely fluctuating. Every year he is recognizing the fact that he must make himself more independent of weather conditions.

Conditions of weather probably more than any other factor vitally affect the farmer's prosperity and no one thing has done any more to eliminate the farmer's hazard of weather conditions than the introduction of electricity on the farm. The control of soil moisture alone, by means of electrically driven pumps, has been of enormous assistance, and this, together with the splendid service furnished by the weather bureaus, has largely taken the hazard out of the production of such crops.

The steam coils to the right furnish the heat and the electric fan at the left forces the warmed air over the raisins which are to be dried.

However, in the harvesting of crops, especially the dried fruit crops of California, the hazard still exists, as many thousands of acres of fruit lands still depend upon the sun drying of their product and an unforeseen and abnormal storm at certain seasons produces calamitous conditions in these drying areas. Each year in the Santa Clara Valley, thousands of prunes are dried in the sun, subject to all the hazards of unforeseen weather.

The accompanying photograph shows a huge artificial drying plant of the California Associated Raisin Company at Fresno. The large group of steam coils shown in this picture furnish the heat, and the power to drive the warm air over the raisins is furnished by large electrically driven fans, which are subject to perfect control for distributing the warm air properly over the fruit. In this way, all hazard is removed from that portion of the crop handled in this plant.

There is a fertile field for the central station companies in the Santa Clara and other fruit growing valleys in the encouragement of well-designed artificial drying establishments which will not only be a benefit to the fruit growers but will form an attractive source of energy outlet for the central station companies.

---

## Long Life and Low Upkeep Makes the Electric Truck Good Investment

IT HAS now become a well established fact that excluding the battery which carries the motive charge, the useful life of the electrical truck exceeds that of any other class of motor vehicle. As a fine example of this long life, the accompanying picture shows one of the three general vehicle trucks which have been owned and operated by the General Electric Company in San Francisco for over ten years. During this ten-year period, the following battery replacements have been made: on the one-ton truck, in November, 1916, and again in March, 1921; on the two-ton truck one replacement was made in March, 1917; on the three and a half-ton truck, one replacement was made in June, 1918. All batteries now in the trucks are reported as being in first-class condition.

The significant feature of these three trucks is driving chains, and sprockets, the trucks proper are apparently in as good condition as when originally received over ten years ago.

A table of figures furnished by the General Electric Company is given herewith which shows the average monthly cost of operation of these

trucks, together with a statement of the average daily mileage secured:

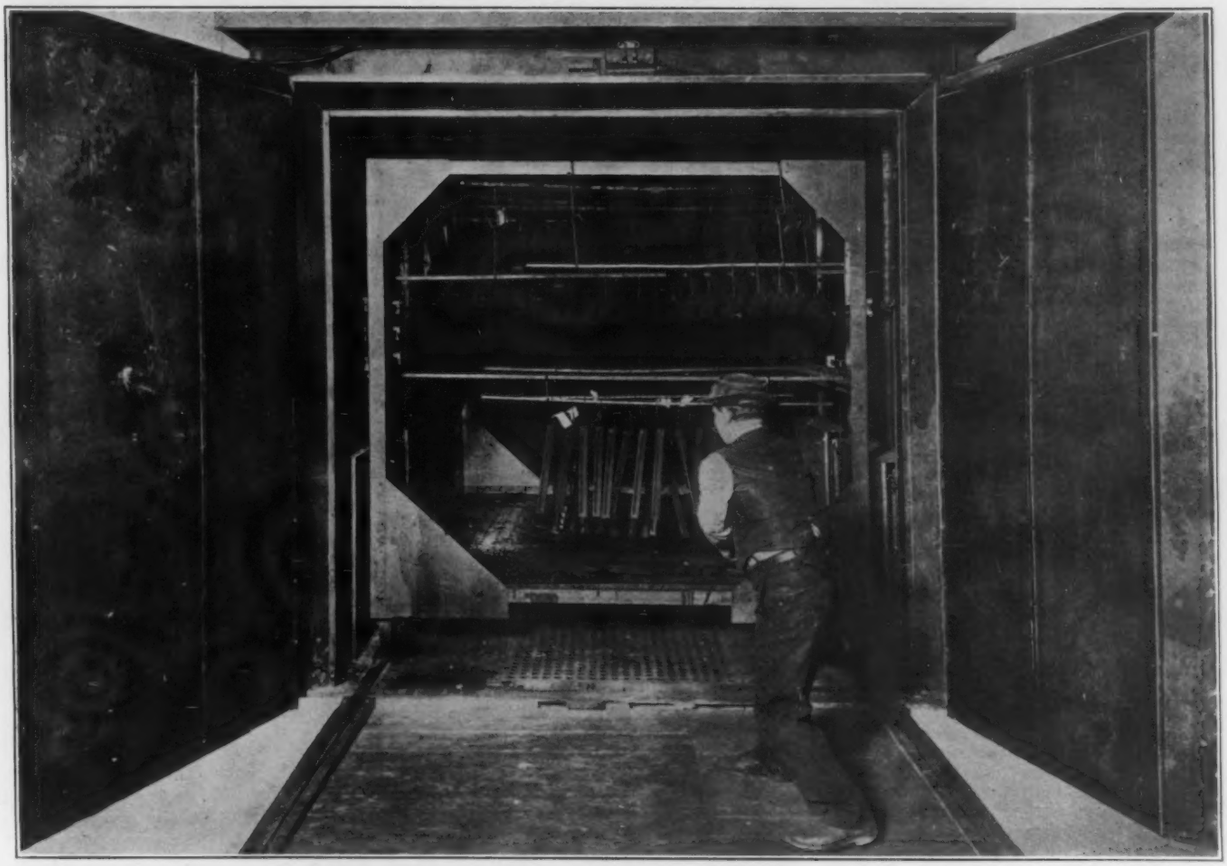
| | 1 Ton | 2 Ton | 3½ Ton |
|---|---|---|---|
| Garaging (Includes current, washing, etc.) | $42.50 | $49.35 | $55.00 |
| Repairs, renewals, etc. (Includes painting, batteries, etc.) | 48.13 | 42.09 | 40.26 |
| Wages | 74.63 | 91.80 | 110.60 |
| Liability insurance | 4.12 | 4.12 | 4.12 |
| Fire insurance | 2.24 | 3.48 | 4.50 |
| Interest | 7.60 | 10.22 | 11.80 |
| Average daily mileage | 20 | 22 | 13 |

The electric truck is in many ways ideally adapted to the heavy short haul work in congested down town districts of the large cities. Its perfection of control in traffic, and its great dependability, due to a practical absence of mechanical troubles, makes it especially adaptable to this work.

Its limitation to date has been the difficulty of securing adequate service, as the comparatively small number of these trucks has not yet given garage companies the incentive to cater to this class of servicing.

In some large eastern cities with the aid of central station companies, this problem has received more attention and encouragement and in one city a plan was worked out by which unit battery containers were arranged to be quickly demounted from any electric truck, and a complete fresh battery quickly installed in its place. In this manner the truck operator could purchase mileage almost as freely as the driver of a gas-driven truck purchases fuel; and the radius of action of electrical trucks was thus very materially increased.

The smallest of the three electric trucks operated by the General Electric Company in San Francisco



Sheet metal furniture being baked in an electric oven. Imitation wood grain and colors are incorporated in the finish with exceptionally lasting wearing effect. The product is much better and stronger than wooden furniture and is lighter. The delicacy of control required to secure even distribution of heat and correct temperature for this work can be obtained only in an electric oven.

# JOBBER, DEALER AND SALES AGENT

## Benefits Follow British Columbia Home Electric

### Electrical Service League Evolves New Plan for Financing Home in Vancouver Which Results in Maximum of Good Will

By REY E. CHATFIELD

One month after the Vancouver Electric Home was closed to the public, a man phoned the office of the Electrical Service League of British Columbia to this effect: "Why, say, I have your electric home beat seven ways—you ought to see my new home. You only had 202 outlets in the electric home and I have 342 in mine. You only had 43 convenience outlets and I have 65." His figures were found on investigation to be correct and he was asked where he got the idea. He answered, "At the Electric Home, of course."

In a few words, that conversation describes the results which were obtained from the sixteen days' exhibition of the first electric home in western Canada, where 21,719 visitors were imbued with the electrical idea. Attendance records for the display were most encouraging, an average of 1,357 people visiting the home daily with a high record of 2,111 for a single day.

To adequately advertise, manage and finance such an exhibition was quite a task for the industry. The chief difficulty to surmount was the question of finance, and this was overcome in a unique way. Through the cooperation of a firm of architects and a firm of plastering contractors the following scheme was worked out.

The selected building supply houses were approached with the proposition that the plastering contractors were financing the building of a model home, which would be exhibited as an electric home by the Electrical Service League of British Columbia, and that tremendous publicity would accrue to the firms supplying material for the home.

Competitive bids were then called for by the architect for the materials needed and the successful bidders were visited by the secretary-manager of the Electrical Service League and a representative of the firm building the home, who in every case succeeded in obtaining a marked reduction in the price for the material specified. The difference between the final price and the first competitive price of the successful bidder was paid to the Electrical Service League by the builder of the home, the local plastering contractors, as the nucleus of a publicity fund. In other words, the building supply houses, lumber mills, shingle mills, etc., bought publicity with their merchandise.

Many firms furnished better material than that specified because they saw the value of the publicity. However, the builder only paid the Electrical Service League and the supply house concerned, jointly, the competitive price for material specified.

Fifteen hundred dollars was raised in this way toward financing the advertising campaign.

The Electrical Service League contributed approximately $750 to the publicity fund and assumed the responsibility of managing the exhibition. The builder agreed to pay the net cost of the wiring installation as specified by the League. This scheme earned the interest and support of the entire building trade in the city.

Having thus overcome the chief obstacle, namely—finance, the League was ready to go through with the home.

The publicity campaign started three weeks in advance of the opening of the home, when a large billboard was erected at the intersection of three main driveways, one-half block from the home. This billboard showed a perspective sketch of the home itself, together with an announcement of the location and the date of opening.

On the site of the home another small billboard was erected giving the names of the cooperating non-electrical firms and the material each supplied.

From the time of erection of these two billboards until the home was completed the workmen were forced to work behind locked doors as people were constantly visiting the home in the hope of seeing it long before the date of the official opening.

The week previous to the opening a large advertisement was run in all three newspapers of the city announcing the opening of the home. After the home opened a second advertisement was run in the newspapers and during the last week a third advertisement was used.

The route for automobiles was clearly marked on all possible roads of approach by signs attached to the trolley poles, "To Electrical Home."

Several days prior to the opening date all street cars connecting directly with the line running to the home and cars on that line, carried fender banners. Conductors on the street cars, instead of calling the name of the street, announced at the proper corner, "Electrical Home." Some 400 street car advertising cards announcing the opening of the exhibition of the Electric Home were used in the street cars. This space was donated by the B. C. Electric Railway Company, Ltd., but the League paid for the cards.

Similar window cards and auto banners were furnished all cooperating firms as well as all members of the electrical industry in the city.

The publicity campaign was quite complete and certainly produced results as far as attendance was concerned.

Exterior of the Vancouver home flood lighted for night display

Many novel ideas in arrangement of the electrical equipment were incorporated into the kitchen

The bed room was completely equipped, including a dressing table with the fixtures attached

Every person leaving the home was presented with a booklet which contained a description of the electrical features and a list of the cooperating firms.

Having made every effort to assure a large attendance at the home, it was necessary to handle the crowd. A house committee of fourteen was chosen from the leaders in the industry, each of which had charge of the exhibition staff during at least one day while the home was open.

The chairman of this committee as well as the chairman of the house furnishing committee and wiring committee reported direct to the manager of the home who was the secretary-manager of the Service League. The demonstrating staff was made up entirely of volunteer help recruited from the industry. There were 440 positions to fill and 116 different men were recruited to do the demonstrating and give the talks. Of this number 49 were contractor-dealers, 23 representatives of electrical manufacturers, 18 jobbers' representatives, 19 from the central station, and 7 from allied interests.

The week before the home opened 150 copies of suggested talks for each demonstrator were prepared in pamphlet form and mailed to the demonstrators. The demonstrators did not learn these talks word for word but for the most part the talks were very closely followed.

A master sheet was prepared showing the dates and station each man was to fill and each individual demonstrator was notified in writing that on such and such a date he was to fill a certain station during a definite shift. Demonstrators served in two shifts of four and one hours each.

The day before the opening of the home a private exhibition was held for the families of men in the industry. At this private exhibition and on the first shift the opening day the house committeemen served as demonstrators so that every committeeman was enabled to become thoroughly familiar with every detail of demonstrating the home.

On the opening day a reception to the executives of the various women's clubs was held and the formal opening of the home was made by the president of the Associated Women's Clubs of Vancouver.

Perhaps the most important men on the demonstrating staff were the door man and the despatcher. The door man counted the visitors with a counting machine and saw that groups of from ten to fifteen only entered the home at a time. These groups of visitors went through the home as a group and were passed from room to room.

The talks in each room were so synchronized that when the despatcher pushed the button controlling an electric bell each group was ready to move on to the next room. The route through the home was arranged so that no two lines of traffic crossed, consequently the visitors were able to see every feature without confusion.

In addition to the two private exhibitions already described, a private exhibition was held for members of the Architectural Institute of British Columbia. No attempt was made to have a full staff on duty for this exhibition, but the architects spent several hours in the home and the men on duty merely answered questions.

Special invitations were mailed for all three private showings of the home and admission was by invitation.

Adequate wiring installation was the keynote of every talk except the talk by the man receiving the visitors upon their entrance to the home. This demonstrator explained the purpose of the home and the manner in which the appliances were chosen.

As a means of creating a desire on the part of the public for better wiring the exhibition was an unqualified success.

Appliance sales have been stimulated and prospective builders are already calling upon the League for assistance in laying out wiring installations.

As a direct result of the home much residence wiring is coming from the hands of the curbstone contractor to the legitimate contractor-dealer and the convenience outlet idea is sold to many people.

Undoubtedly the electric home has done much to promote appliance and better wiring installation sales, but it also did much to cement together the various branches of the industry, as we had curbstone contractor and legitimate contractor-dealer, jobber salesmen and central station representatives working side by side for a common cause.

# Taking the Electric Home Owner Into Partnership

## Calexico Electrical Men, Architect, Builder, Furnishers and Owner Cooperate to Display Electric Home

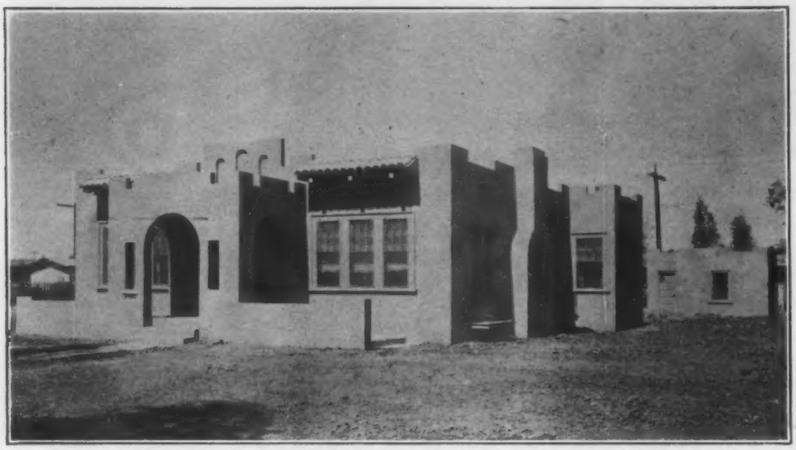
When Dr. and Mrs. A. L. Rice, of Calexico, Calif., signified their intention of building a modern home in the Imperial Valley town, E. W. Judy, district manager of the Holton Power Company, saw an opportunity to give the electrical industry some good publicity and at the same time aid the prospective home owners. The size of Calexico had prevented any cooperative work in building and displaying an electric home and when the announcement concerning the building of the new home was made Mr. Judy visualized a plan whereby it could be used as an electric home for a period of two weeks.

The plan worked out by Mr. Judy provided for the cooperation of the architect, builder, plumber, painter, house furnisher, decorator, and dealers in electrical appliances as well as the owner of the new home, in building, equipping and furnishing a home which would be ideally arranged for the owner and which could be used for display purposes for a short period. Under the arrangement all of the interested parties, and in addition the general public, would benefit from the cooperative work. The home owner benefited through liberal discounts on the furnishings and appliances installed.

The house was planned from the beginning as a real dwelling, built to live in rather than to sell or to quarter a temporary assemblage of furnishings

and decorations. Throughout the building of the home the Holton Power Company exercised general supervision over the work and furnished suggestions as to the locating of convenience outlets, switches, fixtures and appliances.

At the request of the dealers and contractors, the power company also took charge of the publicity for the home. The local newspapers cooperated with the men interested and gave full and detailed descriptions of the electric home. A four-page booklet was also prepared and given out freely. This booklet contained a picture and description of the home, and detailed the furnishings and appliances installed there.



Home built by a Calexico, Calif., doctor and displayed as an electric home through the cooperation of the owner and the men building and equipping it

Prior to the opening, invitations were sent out to the customers of the power company, the dealers exhibiting appliances, furnishings and fixtures, and to many others whose names were obtained from the books of the men interested in the success of the display, so that a general broadcast was made throughout the town. During visiting hours music and refreshments were provided for the guests. Mrs. Rice acted as hostess in her home, which was open for visitors from 1 to 4 in the afternoon and from 7 to 9 in the evening. Nearly a thousand visitors were conducted through the home between Oct. 10 and 24, the time that it was open.

The electrical men of Calexico furnished guides and lecturers, who conducted the visitors through the home. Approximately three-quarters of an hour was the time that each guest remained inspecting the modern structure. E. W. Judy was in charge of the exhibit and had under him F. G. Waite, Fred Nebel-Thau and several other men.

Among the electrical appliances demonstrated in the house were the range, water heater, dish washer, washing machine, ironer, vacuum cleaner, lighting fixtures and baseboard outlets, motored phonograph and player piano. A radio outfit was also included among the attractions. There were in the home forty-one convenience outlets and each was located so that it might be easily used when needed. Every effort was made to make the home practical and to avoid installation of too much electrical equipment in comparison with the size of the house.

No attempt to take orders was made at the home during the time that it was open to visitors. Men in the electrical business in Calexico report that after the home was closed to visitors many sales resulting from the display were made and that a large number of prospects were secured for future business.

The concensus of opinion of the men who were instrumental in the display was that it had been a great success and that a great deal of good had been done at a low cost. The arrangement figured out by Mr. Judy was particularly adaptable to the small town and could be followed to advantage in other communities where the expense of erecting a home for display purposes would not be justified.

## THE ANVIL COARSE

By JOE OSIER

When an old Arabian philosopher (whose name has slipped the thing I am pleased to call my mind) was up against it and did not know which way to turn—

He would flop down on a convenient sand dune, produce a cigarette—preferably Turkish—and—

Mumble this mouthful: "When you are an anvil, be patient; when a hammer, strike."

And, as I have been given to understand that this Arab obtained a mess of solace from this saying, it occurs to me that Men in the Electrical Industry, who are in a corner and—

Are so hungry and do not know where they are going to sleep—

Might hug this truism to their tired ol' hearts and see how far they can get.

"Comes the time," as the fiction writers say—

When all of us, perforce, must be anvils and, come other times, when we are presumed to assume the role of a striker and—

If we play the game as it should be played, we can shine equally well in either character.

As I see it, we are anvils when the times are "tuff"; when jobs are as scarce as redeemed campaign pledges and, by the same token—

We are hammers when everybody and their brothers are importuning us to "please accept this job at your own figure."

Then, friends, is the time to make hay, garner the sheaves and get the gravy because—

Shortly the Winter winds will be whistling through our straw derbies, inquiring "how come" you didn't gather the rosebuds while the—

Gathering was good.

Any smart man knows—(I'll take my bend now) that—

"The crying cat catches nothing" and that the kittie before flagging a mousie must do her stuff entitled:

"Watchful waiting."

And the same goes for the Boys in the Electrical business—because—

I am not concealing anything in my sleeve when I yelp that the Contractor-Dealer, or whosis—in the game—

Who is forever crying about slow sales, poor collections and knocking the business from—

The naughty word to breakfast—

Is not making friends, building a business that will endure or successfully breasting a tide which—

Eventually he will have to swallow.

In fact, Birds of this feather have not learned that: "The remedy against bad times is to be patient with them" and—

As sure as I am putting forth every effort to arrive at the bottom of this column without mortally offending any indulgent reader or—

Two, timing myself—

I know that Men of the Trade must throw away the hammer and pick up the horn and get busy—

Blowing up the business—else, some day they are liable to come to with the realization that they—

Have absolutely nothing to blow about.

"The crying cat catches nothing," I repeat and—by the same token, the man who is continually whimpering about the bow wows over the cadaver of an institution that has gone haywire—

Likewise catches nothing but a pitiful lack of sympathy from—

Butchers, bakers, bankers and bondmen.

He is as popular as a lifelong Republican at a Tammany rally and—

Seeing that my space is all gone, I'll close by saying—

I have said it.

---

Install a convenience outlet on the front porch so that appliances may be used here in the summer or a portable reading lamp set up on warm evenings.

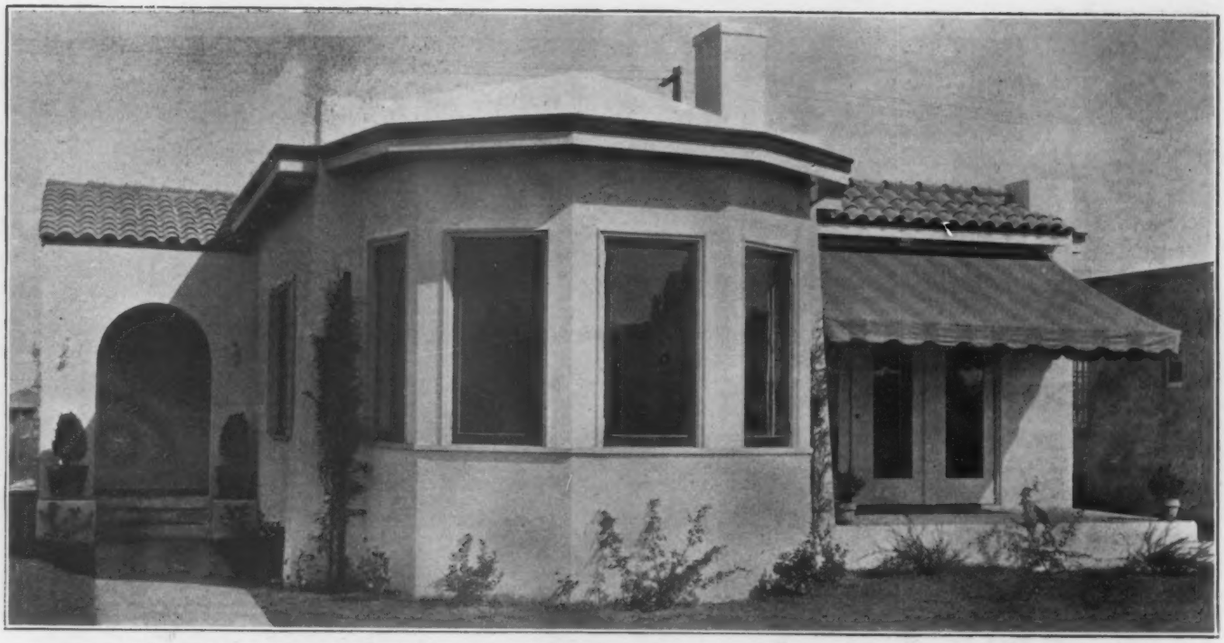
---

Arrange the kitchen lighting so that there will be no bad shadows on the equipment most frequently in use. Install at least one bracket over the sink and another over the range.

The Kitchen with its Electric Range and Convenience Outlets

The Home Electric and the sign which advertised its Location

Correct Illumination demonstrated in the Living Room



The exterior of the Stockton electric home was made more attractive by the growing shrubbery and green grass

# Exhibiting Electric Home in Small Community

## Stockton Electragist and Builder Demonstrate that Two Firms Can Successfully Display Home Unaided

That it is feasible for the individual electragist in cooperation with a progressive builder to successfully exemplify the "home electrical" idea in the smaller communities has just been demonstrated by the recent completion and exhibition of the first electric home to be displayed in Stockton, Calif.

Most of the electric homes receiving publicity heretofore have been those made possible through the agency of some cooperative league or organization, with a considerable portion of the cost of the undertaking being donated in some form, either in direct contributions, or supplies and labor furnished at cost. This system has not been possible in the smaller communities which have not the advantage of the direct aid of a cooperative or development league of some nature in educational work. To the electragist in such communities, the result of the first attempt to portray the "home electrical" idea in Stockton, should be of great encouragement.

The home was a frank attempt on the part of the builders, the Sterling Building Company and the Home Electric Company, to gage the interest of the community in homes featuring the idea of electrical service. The attendance figures and the sale of the home, shortly after being opened to the public, were unequivocal answers to their question.

The home is a six-room stucco bungalow, with hardwood floors throughout, tile bathroom, furnace, basement and separate garage. It is moderate in its dimensions and is meant to typify the class of home which represents a medium investment, but with particular emphasis placed on its facilities for electrical service. It was priced at and sold for $8,000. During its exhibition to the public it was completely furnished in excellent taste, through the cooperation of furniture and music stores.

In the electrical installation the Home Electric Company did not attempt to carry the idea of a multiplicity of outlets to the extreme, but rather endeavored to show a comprehensive use of electricity which could be secured in any home with reasonable cost. This happy medium was well attained, the wiring system providing thirty-nine luminaire outlets, nineteen convenience outlets and twenty-six switch outlets, some of which follow:

Front Porch:
1 ceiling and 2 bracket outlets, 1 three-way switch.

Reception Hall:
1 ceiling outlet, 1 switch, 1 three-way switch, 1 convenience outlet.

Living Room:
2 ceiling and 4 bracket outlets, 3 switches, 3 convenience outlets.

Dining Room:
2 ceiling outlets, 2 switches, 1 floor outlet, 1 convenience outlet.

Kitchen:
1 ceiling outlet, 2 bracket outlets (over sink and range), 3 switches, electric range outlet, 2 convenience outlets.

Bedroom:
1 ceiling and 3 bracket outlets, 1 switch, 1 convenience outlet, 1 ceiling outlet with door switch in closet.

Bedroom:
1 ceiling and 4 bracket outlets, 1 switch, 1 convenience outlet, 2 ceiling outlets and 2 door switches in closets.

Sewing Room:
1 ceiling outlet, 1 switch, 1 convenience outlet, 1 ceiling outlet with door switch in closet.

A comprehensive display was made of all the smaller appliances connected to appropriate convenience outlets and in addition an electric range, an electrically heated and operated mangle, washing machine, dishwasher, motor-driven player piano, and motor-driven phonograph were shown in operation.

The house was open to the public for inspection for a period of thirty days, during which time an attendant was always present to call attention to the points of interest and explain the use and operation of the various appliances. A check count showed an attendance in excess of six thousand people. Great interest was shown by the visitors and the predominant thought seemed to be one of surprise that a home of that type of construction, with so many electrical conveniences, could be secured at the price at which it was sold. It was striking evidence that the public generally has not yet realized the reasonable cost of electrical convenience and the household economy which such an investment will make possible.

All advertising was in the form of newspaper display carried on by the builders and various sub-contractors, and consisted principally of a general invitation to the public to examine the home, without attempting any description. It was estimated by the builders that the portion of the cost of this advertising which could justly be charged against the electric home idea did not exceed six cents per visitor. In the light of the interest displayed during and since the exhibition, this has been eminently satisfactory to those who bore the expense.

The builders of this home are convinced that the public is interested in electrical convenience in the home and are planning for a much more elaborate display next year, featuring a larger house with corresponding increase in the electrical service, actual cooking, washing and ironing demonstrations, more intensive advertising, and a comprehensive record of the facts and inquiries brought out by those who attend the exhibition. The first electric home has marked a definite step forward in the advancement of electrical service in the home in this community.

The Mt. Baker Home was the larger of the two displayed by the Electric Club of Seattle

# Seattle Club Shows Two Homes Simultaneously

## Two Distinct Types of Electric Homes in Different Sections of Washington City Draw Large Crowds

When the Electric Club of Seattle planned to sponsor the idea of displaying an electric home in the Washington city, the members of the club decided that to reach the greatest number of people it would be best to erect two homes of different style and cost in different residential sections of the city. With this idea in mind the two homes were built and for the opening an Electrical Week was proclaimed by the mayor of Seattle. One of the homes erected cost approximately $20,000 and the other entailed the investment of between $12,000 and $14,000.

The decision in favor of opening two homes instead of one, according to Harry Byrne, of the North Coast Electric Company, chairman of the executive committee in charge of the homes, was reached after considering the following questions:

First: By locating these homes in different residential sections of the city, greater convenience and ease of access would result to those who were unable to travel to the homes by automobile. The club desired to reach not only prospective home builders, but prospective purchasers of electrical appliances as well.

Second: The publicity necessary to properly advertise one home could be made to serve for both without increased expense.

Third: Homes of different size and cost could be used. One that would appeal to the class interested in a $7,500 home and the other to the class interested in a $20,000 or more costly one. All the above advantages were gained and others which were not foreseen.

Fourth: It may be said that our list of attendances includes many duplications and that people who visited one home also visited the other. While this may be so, it enabled us to get our message to them more effectively, as it was felt that those who were sufficiently interested to visit both homes were undoubtedly very good prospects for better wiring and appliances.

Regarding the educational value of exhibits of this kind and the effectiveness of the advertising which results, members of the committees were unanimous in the opinion that considering the time and money spent in this way, it is unequaled by any other form of campaign in the interest of better wiring of homes and domestic electric appliances. It was the opinion that while these things would undoubtedly come in time without any special effort on the part of the electrical fraternity, these electric homes will advance the day many years.

These homes, one located at North Broadway and Allison Street, known as the North Broadway Home, and the other at 3134 Lakewood Avenue, known as the Mt. Baker Home, were designed and built by Gardner J. Gwinn, a Seattle home builder. Following the show the homes were turned back to Mr. Gwinn.

The electric homes were sponsored by the Seattle Electric Club. The work was done by a committee of club members appointed by Walter E. Jones, president of the organization, and consisted of the following members: Harry Byrne, chairman; S. G. Hepler, H. E. Gleason, Roy Grant and F. W. Rust.

From time to time sub-committees were appointed by this committee, which became known as the executive committee, and the chairman of these committees took their places on the executive committee. Sub-committees were appointed and placed in charge of plans and specifications and later another sub-committee was placed in charge of the appliances. A speakers' sub-committee and a sub-committee in charge of the reception and the operation of the homes, were also appointed.

The Mt. Baker Home, the larger of the two, was wired for service by F. W. Rust & Company, Inc., and the North Broadway Home by the Arrow Electric Company. In the case of both homes, the various electrical supply houses furnished the materials at cost; labor was furnished at cost and the work of supervision was donated by F. W. Rust, of F. W. Rust & Company, Inc., and S. G. Hepler, head of the Arrow Electric Company.

The appliances displayed at the two homes were donated for the campaign by the various dealers and were returned immediately upon the close of the campaign.

Everything necessary to make the campaign thoroughly educational in its nature, free from every aspect of commercialism, was carefully carried out by the committee. Name plates were removed or covered over and all those engaged in any way in the electrical business were accorded an opportunity to participate. Practically the entire electrical fraternity in Seattle worked in the campaign and got squarely behind it. Because of its educational value and its community nature, the Seattle daily newspapers gave unsparingly of their news columns and the publicity was of extraordinary value.

Mayor Edwin J. Brown proclaimed the opening week Electrical Week and seventy clubs and civic organizations put on special events and entertained speakers furnished by the executive committee of the Seattle Electric Club.

On Sept. 22, the two model homes were thrown open to the public and were dedicated with appropriate ceremonies. Miss Theo Pennington, leading

soprano of the American Light Opera Company, playing at a Seattle theater, christened the homes, Mayor Brown spoke on behalf of the city of Seattle, and Mrs. H. E. Maltby, president of the Seattle Federation of Women's Clubs, officially opened the homes.

The first ceremony was held at the North Broadway Home where Harry Byrne presided, introducing Mayor Brown for the opening address. Mayor Brown in turn introduced Miss Pennington who performed the christening rites. Mrs. Maltby then opened the home with a short address after which it was formally turned over to Walter E. Jones, president of the Seattle Electric Club.

As soon as the ceremonies at the North Broadway Home were completed, the participants hastened to the Mt. Baker Home where a similar program was carried out. Thereafter, until the display closed on Oct. 9, the homes were thrown open from 2 p.m. until 10 p.m.

Both homes, during the campaign, were under the general direction of a house committee headed by Burton R. Stare, of the Burton R. Stare Company. At the North Broadway Home, Walter E. Jones was house manager, with L. R. Grant, James Maitland, Fred Lushington and C. D. Cunningham as his supervisors. Philip F. Apfel, house manager at the Mt. Baker Home was assisted by J. J. Agutter, Herbert A. Boring, George T. Doty and J. George Miles as supervisors.

The house managers and supervisors at each home were assisted by thirty-two lecturers. At the North Broadway Home fourteen lecturers were on duty and at the Mt. Baker Home eighteen were employed daily. In spite of the efficient lecturers in attendance constantly, it was found necessary to take visitors through in small groups. By arranging the routes through the homes, approximately eighty persons could be handled at one time.

During the campaign, according to unofficial figures given out prior to the close of the show, more than 40,000 visitors were entertained and shown through the two homes.

Both homes were completely furnished by the Standard Furniture Company, with rugs, draperies and every article of furniture in proper place and selected to harmonize with the lighting scheme. Pictures and art framed mirrors for the walls were loaned by the Schneider Art Galleries. On the opening day both show houses presented the appearance of being ready for immediate occupancy.

The Mt. Baker Home is a two-story, brick veneer structure, containing eight rooms and a full cement basement in which is located a large billiard room, also a double garage. The North Broadway Home is a nine-room, one and one-half story structure, of stucco construction, having one of the few thatched roofs in Seattle. This home also has a double garage located in the basement, in addition to heating equipment, laundry space, and the like.

The North Broadway Home is equipped with forty-nine duplex convenience outlets; forty-four light outlets; thirty-nine switches, and is wired for radio as well as for telephone, heating and lights. All wiring is run underground to the poles. The tea cart in the North Broadway Home is equipped with two convenience receptacles and the dining table with three. Three electric bells are also a portion of the modern features of this up-to-date home.

The Mt. Baker Home has a total of sixty-nine lighting outlets, thirty-nine switches, twenty-seven convenience and floor outlets, four heater outlets, a dining room table wired for four outlets and a tea wagon with two outlets, in addition to a great number of other electrical appliances. Service wires enter the home underground as in the North Broadway Home.

# Better Homes Exposition Features Electric Home

## Visitors to the Number of 42,000 Are Told Story of Electrical Conveniences at Oakland, Calif., Exhibition

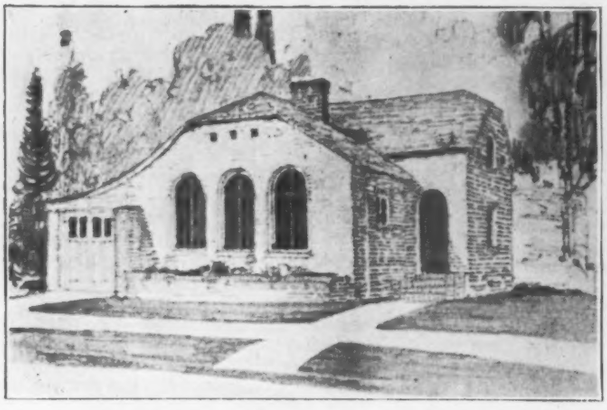
When the Lakeshore Highlands Company, realtors and subdividers of Oakland, Calif., decided to open up the newest residential subdivision in that city with a Complete Homes Exposition, in which ten completely furnished modern homes would be exhibited to the public, the electrical industry, through the California Electrical Cooperative Campaign, had little difficulty in selling the company the idea of including a home electric in the exposition.

During the four weeks which the homes were open for public inspection, the subdividers realized the importance of a home which would show how completely electricity has solved the problem of tedious household duties. Of the ten homes displayed, and the electric home was by no means the most pretentious, it maintained the position of chief attraction at the exposition, its attendance averaging 1,310 visitors daily during the 32 days the exposition lasted. Approximately 42,000 interested home owners or prospective home builders were shown what electricity can do to lighten the housework in a modern home.

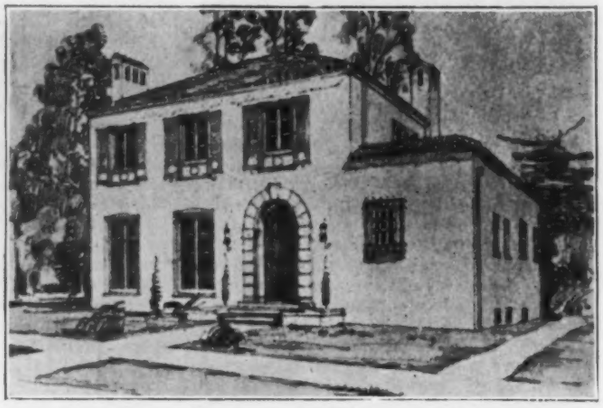
While the electric home was used for the purpose of demonstrating the conveniences and comforts attainable through the proper use of appliances, each of the ten homes was completely wired and almost any one of them might have been used for the same purpose.

The model electric home was one of ten completely furnished modern dwellings comprising the first exposition ever held in America in which every detail of home making was actually demonstrated in a group of specially designed houses conveniently located in the heart of a beautiful residential district. An unique opportunity was thus presented to judge of the merits of the better types of construction, the structural qualities of the various building materials and the advantages of the latest home fixtures and appliances. The ten homes ranged through a wide variety of cost and design, but each was expressive of the best result which could be obtained for the outlay. In the group were two homes of the northern Italian type, two typical Spanish bungalows, two modified Spanish or California bungalows, two modified English cottages, a hollow tile and brick house and an all-redwood bungalow.

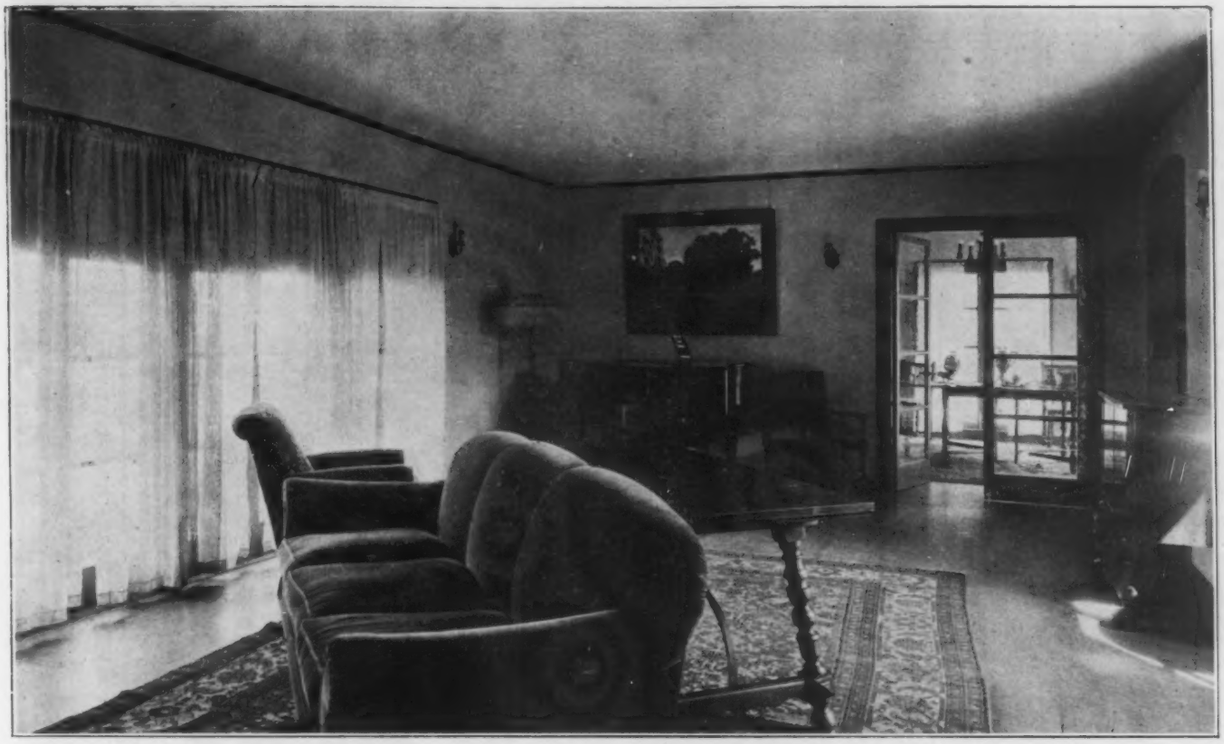
The electric home was financed and built by the realtor. It was sponsored by the Oakland Electric Club while W. F. Price, field man of the California Electrical Cooperative Campaign, was loaned to the club to supervise the exhibition of the home. The Pacific Gas & Electric Company and the Great Western Power Company shared the expense of employing a hostess during the time the home was open. One of the central stations furnished the range



The Tile Home, built entirely with brick and tile



The Sloane Home, one of the ten in the Exposition



The living room of the Electric Home contained an electric piano, phonograph and an electric log in the fireplace

while the other furnished the water heater. The air heaters were furnished by the manufacturer while four jobbing houses loaned the appliances which were displayed.

During the hours which the home was on display, in addition to Mr. Price and the hostess, there were at all times two or three lecturers furnished by the Electric Club or by the central stations. That the task in conducting visitors through the home was no easy one is demonstrated by the fact that on the Sunday preceding National Better Homes Week a total of 4,766 people were ushered through the home. This is approximately 500 visitors per hour.

Important among the results of the display, aside from telling the electrical story to one-tenth of the population in the East Bay district, was the stimulation of electrical sales. The manufacturer's representative for one of the types of the washing machines displayed reported sales aggregating over $20,000 during the month the display lasted. The demand for lighting fixtures of a better grade was also increased directly as a result of the exposition while the central stations reported that sales of ranges were increased and interest in electric air and water heating was stimulated.

Working along side by side with the men in charge of electrical homes, are the distributors of electrical equipment. The Western Electric Company is at the present time conducting a comprehensive advertising campaign in southern California. The billboard shown is one of fifty-six erected to increase the sales of electrical appliances to home owners, that these may be made as nearly electrical homes as possible.

# INDUSTRIAL NEWS

## Moffat Tunnel Law Is Upheld by Colorado Supreme Court

By a ruling of the Supreme Court of the State of Colorado, in which all seven judges concurred, the law passed by the legislature of the state, providing for the construction of the Moffat Tunnel, has been held valid. Persons who have been objecting to the apportionment of the sum of approximately $7,000,000 for the work, claiming that the law was unconstitutional, have been defeated and the sale of bonds will be started in the near future.

Under the provisions of the law, a tunnel commission is to be formed which will supervise the selling of bonds, boring of the tunnel and the general management of it. The tunnel itself will be about 6 miles long and will be at an elevation of nearly 9,000 ft. A railroad to connect the western portal of the tunnel with the Denver and Rio Grande at Dotsero will also be constructed. For the use of the tunnel the railroad will pay the tunnel commission a rental to be fixed by the commission.

The tunnel will connect the two halves of the State of Colorado, which are now separated by the Continental Divide. Estimates are that the distance between Salt Lake City, Utah, and Denver, Colo., will be lessened 55 miles over the Union Pacific System and the route of the Denver & Rio Grande will be shortened 172 miles. A rich mineral and agricultural district will be opened by the new tunnel and its connecting railroad.

## New York Syndicate Makes Bid for Canadian Railway

Vernon Lloyd Owen, representing a New York syndicate, has been negotiating with the Provincial Government of British Columbia, with a view to the syndicate taking over and operating the Pacific Great Eastern Railway. It is proposed that the Provincial Government should have 25 per cent in the stock of the company, which is to be called the Peace River Corporation, and that the syndicate shall take over the bond issue for the amount already paid in actual construction and shall spend $30,000,000 in carrying the line into the heart of the Peace River region.

A number of prominent New York financiers, it is stated, including Otto H. Kahn, J. D. Ryan, C. A. Stone, Percy Rockefeller, and Frank Vanderlip are interested in the syndicate, and are prepared to underwrite the bonds, if the British Government will guarantee 6 per cent interest for ten years and the Provincial Government for a further ten years; the total bond issue to be $100,000,000.

The Pacific Great Eastern Railway has been completed from Squamish, at the head of Howe Sound, to Quesnel, in the heart of the Cariboo country. It is owned and operated by the Province, and up to now has been somewhat of a white elephant. It may be said to begin and end nowhere.

The original idea was to run a ferry service from Squamish to Vancouver and possibly Victoria in connection with the railway, and until this is done and the line is completed to Prince George, where it will connect with the Canadian National system, it cannot hope to be successful.

At the present time the interest on the bond issue and operating expenses are costing the Province between two and three million dollars annually. In the spring of this year, at the request of the Provincial Government, J. G. Sullivan, formerly chief constructing engineer for the Canadian Pacific Railway, made an investigation of the line, and his recommendation amounted to abandoning the line and salvaging as much as possible.

## San Francisco Engineer Invents X-ray Measuring Device

An "X-ray clock," which its inventor claims will automatically measure and dispense any desired degree of intensity in X-rays, was recently demonstrated before a group of physicians in the laboratories of the St. Francis Hospital in San Francisco. The inventor, Frank Reiber, is a San Francisco electrical engineer and Roentgen ray expert. The "X-ray clock" is the third of a set that he has created and will, he claims, cure cancer.

In the recent demonstration, radium emancipations were first turned upon the sensitive clock and the degree of intensity was gradually increased until the rays were so powerful that they would have withered human flesh. The clock measured the amount of the dosage that was being given off by the X-ray machine that it was attached to.

**The Great Northern Utilities Company** of Great Falls, Mont., has recently filed articles of incorporation with the secretary of state of Montana. This company is organized for the purpose of supplying power and other electric service in the state. Capital stock to the amount of $3,000,000 is provided for in the articles of incorporation. The directors of the new corporation are: F. D. Fletcher, J. F. Mooney and O. C. Allan, all of Great Falls.

## Portland Company Plans Plant and Line Extensions

It is reported that the Pacific Power & Light Company of Portland, Ore., has determined upon hydroelectric high power line extensions in its territory to cost about $6,500,000. Included is to be a hydroelectric plant to be erected at the reclamation power site on the Deschutes River fifteen miles from the mouth, where 10,000 hp. will be developed.

Sixty miles of high tension line will be constructed this winter from Kennewick across the lower Horse Heaven district and during the following summer extensions will be continued to the new power site. Eighty-five miles of further extensions will be constructed furing the summer from the reclamation site to the new plant of the Portland Railway Light & Power Company at Oak Grove. The transmission lines will cost $1,500,000 and are to link the electric service of the Montana Power Company and the Puget Sound Power & Light Company with an aggregate capacity of 900,000 hp.

The Pacific Power & Light Company has applied to the federal power commission for preliminary permits for ten sites on the Snake River between Homestead and Lewiston. This is reported by W. G. Hoyt, hydraulic engineer of the U. S. Geological Survey.

## Power Petitions Pending Before Federal Commission

Eight power applications for the development of 1,581,865 hp. are at the present time pending before the Federal Power Commission at Washington, D. C., according to the annual report of the commission published recently.

Most of the permits are for sites on the tributaries of the Colorado River and action on them has been deferred until definite action concerning the Colorado River Commission findings can be taken. There have been before the commission fifteen applications involving plans with an installed capacity of 209,160 hp., in Idaho, and in Wyoming four applications calling for the development of 4,710 hp.

**Expenditures amounting to** $1,000,000 will be made by the Portland Gas & Coke Company for immediate improvements and additions to its properties, according to official announcements. The growth of Portland and its suburbs makes it necessary to plan for large facilities for distributing gas and for additional holder equipment costing $650,000 and about $300,000 will be required for more gas producing facilities.

## Electrical Supply Jobbers Meet At Coronado

The regular quarterly meeting of the Pacific Division, Electrical Supply Jobbers' Association, was held at the Hotel Coronado, Coronado Beach, Calif., Dec. 7, 8 and 9. At the open meeting held Saturday morning, S. M. Kennedy, vice-president in charge of public relations and service, of the Southern California Edison Company, spoke on "Electrical Business Development for 1923." He said that his company expects to bring in 125,000 hp. of additional energy in 1923. The sale of this power in the districts served directly by the company, means that there will be about 30,000 new residential consumers added and approximately 57,000 hp. added in motor load. He estimates that 30,000 new residential customers will spend $15,000,000 for ranges, water heaters, appliances, wiring, meters, services and distribution lines. Of this amount, $6,000,000 will be for labor and $9,000,000 for material. Motors and wiring will represent an expenditure of $1,140,000. The jobbers and dealers are very much interested in the $18,000,000 of the total of $30,000,000 which will be spent for materials and supplies by the customers and the company itself in carrying out this program. His estimates show that the company must sell 1,500 ranges and 500 water heaters, representing an investment by the consumers of $400,000. So far as the sale of the ranges and water heaters is concerned he feels that an accepted policy is necessary. These will be sold largely through the contractor-dealers, but the company will assist in the financing of the sale and the installation where necessary. The arrangements will be such that the dealer can buy ranges and water heaters and make the same profit that the company will make on direct sales to the customer. Sixty additional salesmen have already been put out in the field to carry out this sales program. Quotas will be assigned to each district and prizes given to those districts that exceed their quota for the first seven months.

A. W. Childs, commercial manager of the Southern California Edison Company, outlined the range and water heater campaign in greater detail. He feels that the sale of appliances can be handled by the contractor-dealers, but that owing to the inability of the dealer to finance range and water heater sales the company will have to get behind this campaign to carry it out successfully.

W. S. Berry, sales manager of the Western Electric Company at San Francisco, spoke on the work of the "Society for Electrical Development." He said that he has been thoroughly sold on the idea and spoke in order to arouse more interest among the jobbers, manufacturers and central station men who were present. He explained that there is not more interest on the Coast because the work in this section has been largely sectional. He told of the corps of experts at work in the general office of the society, the 100 newspaper advertisements, the publication of magazine articles, the work with the Underwriters for better fire protection, the papers on opportunities for doing business, the studies of different electrical leagues throughout the country, the many bulletins issued, etc. He feels from his many talks on the Coast that the central station people are looking at the matter more kindly, and he has hopes for future increase of membership in that field.

Several meetings of the Advisory Committee of the California Cooperative Campaign were held during the three days of the jobbers' meeting. On Wednesday, Dec. 6, the committee entertained as guests, representatives of the San Diego Consolidated Gas & Electric Company, and a number of representative electrical concerns of San Diego, at a luncheon conference to discuss plans for furthering the campaign to electrify every household in California. Robert L. Eltringham, manager of the cooperative campaign, in discussing the work of the campaign stated that through greater appropriations which have been asked for to carry on the work in 1923, it is planned to direct the work along two major lines, i. e., education within the industry, and educating the public. The electrical industry itself is not thoroughly sold on the merits of some of the electrical appliances, and before we can expect to sell the public we must sell ourselves. Ten illuminated billboards will be erected along the main arteries of travel of the state to tell the message 24 hours a day. Ten electrical homes are planned for the year; five in the north and five in the south. These homes will be in charge of the campaign's own high-class demonstrators. At the beginning of 1922 there was being installed an average of two convenience outlets to each new home erected, now the average is one and a quarter to each room. Charts are being prepared to show what each convenience outlet means to the four branches of the industry. This will be expressed in terms of the increased kilowatt-hours used and the value in dollars and cents of the additional wiring and appliances sold. It is also planned to lay stress on the campaign for better store and window lighting. A portable window lighting exhibit is being made up which will be moved from place to place for giving demonstrations. Investigations indicate that there are possibilities in this field little realized by those in the industry.

The Los Angeles members of the entertainment committee arranged for a trip to Tiajuana, Mexico, for Friday afternoon. The horse races in the afternoon provided excitement for everyone and in the evening a banquet was served at the Casino. On Saturday afternoon the golf tournament was played off, the winners being as follows: A. W. Childs, commercial manager, Southern California Edison Company, Central Station Cup and Deming Trophy; B. E. Rowley, district manager, Edison Electric Appliance Company, Salt Lake City, Turner Trophy; W. S. Berry, district sales manager, Western Electric Company, San Francisco, Jobbers' Copper Cup.

---

**On a stock merger** to become effective Jan. 1, 1923, the Washington Water Power Company of Spokane, Wash., is to acquire the Okanogan Valley Power Company. The Okanogan company operates two hydroelectric plants and owns 100 miles of transmission line.

## Olympia Power Company Installs Worthington Turbines

The Olympia Light & Power Company, of Olympia, Wash., has just completed the installation of two new Worthington water turbines of 800 hp. each. These machines will operate at 514 r.p.m. and have complete equipment including Worthington 5,000-ft.-lb. oil pressure governors. These machines will replace the Victor turbines which were installed in 1903.

An order has already been placed with the Westinghouse Electric & Manufacturing Company for a 750-kva. revolving field a.c. generator for direct connection with the new turbine. This generator is to be of the 24,000-volt, 3-phase, 60-cycle type and will be equipped with a direct-connected exciter. A second unit for the other wheel will be considered later.

A 24-kva. series transformer outfit for seventy-eight Westinghouse-Cutter series street lamps for the City of Olympia, has also been ordered from the Westinghouse company.

## Public Utility Rate Contracts Discussed by Commission

The California State Railroad Commission recently issued a statement in explanation of its policy of fixing uniform rates for all public utility consumers in disregard of special and preferential contracts. The commission's statement is that a public utility company cannot maintain special rate contracts with consumers as against the superior rate making power of the state. The statement holds such contracts valid only between companies which are not public utilities.

The commission's statement was issued in view of two recent decisions of the Supreme Court, one sustaining and the other reversing the commission in setting aside preferential contracts. In the one case the court held that the company was not a public utility and hence the commission did not have power over its contracts; in the other case the court upheld the commission's ruling that the company was a public utility and sustained the commission in disregarding contracts affecting rates.

## Request Permit for Electric Railway in Southwest

An application has recently been made to the Interstate Commerce Commission by the Colorado, Columbus & Mexico Railroad for a certificate to construct an electric line from Farmington San Jaun County, N. M., to Columbus, on the Mexican border, 400 miles through western New Mexico, with branches into Arizona and toward El Paso.

The company was incorporated in 1905 by A. O. Bailey, J. G. Hilzinger, W. R. Merrill, A. J. Clark and B. Y. McKeys. A short time ago the Interstate Commerce Commission was requested to give the company permission to put $20,000,000 worth of bonds on the market.

No statement as to where the company plans to obtain its electrical power is contained in the application for the certificate. An attempt might be made to harness the Colorado River to secure the necessary energy.

Architect's drawing of proposed Pacific Gas & Electric Company's Building, with Matson Navigation Building at the left

## Pacific Gas & Electric Company to Erect New Building

A new 17-story office building to be used for the housing of the general offices of the company is to be erected in the near future by the Pacific Gas & Electric Company on the southeast corner of Market and Beale streets in San Francisco. This building is to be a Class A building throughout and will cost in the neighborhood of $1,500,000. The structure is to stand on the west half of the block between Beale and Main streets, the other 50-vara lot on the Main street corner to be occupied by the 16-story building of the Matson Navigation Company, which is now under construction. The two structures combined, will present one of the most striking blocks in the city.

Architecturally, the design is a new treatment of the problem in a simple, dignified and monumental manner. The first story arcade with its central arch, the plain and simple shaft and the colonnade at the top, are the features of the exterior. The windows are so grouped as to carry vertical lines from the base to the cornice, these lines being accentuated by the colonnade and the broken cornice.

The entire site will be covered by the first floor, which will be devoted to those departments having most frequent and intimate contact with the public, and to an auditorium for general assembly purposes seating 500 people. The main entrance lobby will be a distinct architectural feature giving ready access to the elevators, the assembly hall, and the departmental offices on either hand.

Steel, concrete and brick will be employed throughout the building, except for the exterior which will be of terra cotta, with a granite base. Marble will be used extensively on the first floor and marble tile in the upstairs corridors. Provision is to be made on the sixteenth floor for a general employees' lunch room. Employees' activities are provided for, in the way of a library, rest rooms and conference rooms. The elevator machinery, tanks and other necessary mechanical equipment are placed in the attic story, so that the roof will not be disfigured by pent houses and other unsightly structures.

The mechanical installation for the building will be thoroughly modern. Forced ventilation will be adopted for the lower stories, to prevent noise and dust entering through open windows on the street fronts. Investigations are being made as to the adaptability of alternating current elevators, in which remarkable field advance has been made in the past few years. A battery of six high speed cages will be required for adequate service. One of the more novel features of the design is the provision of a parking space for automobiles in the basement, access to which is obtained by way of a ramp descending from Beale street.

The structure will house the general offices of the company, which are now scattered among five buildings in all parts of the city, the entire 120,000 sq. ft. of effective area being necessary for the purpose. The San Francisco district offices will doubtless be retained in their present location on Sutter street, but all departments of a general nature operating throughout the system will be concentrated at the new site.

The architectural design is by Bakewell and Brown, architects, of San Francisco, who have associated with them C. H. Snyder, consulting structural engineer, and Hunter & Hudson, consulting mechanical engineers. The comany is being represented in the arrangements through its department of engineering, of which A. H. Markwart is the vice-president in charge.

## Automatic Substation Will Be Erected in Vancouver

A new automatic substation, to cost $65,000, will be built in the near future by the British Columbia Electric Railway Company on Bodwell Road in South Vancouver, B. C. So far as is known this will be the first automatic substation in Canada.

The new substation will be used to feed the Main Street, Fraser Avenue and Victoria Road lines, which are now served by the Main Street and Earls Road substations. A rotary converter of 1,000-kw. capacity and transformers to step the current down from 34,000 volts will be installed.

When completed, the new station will improve the service on the street car lines in South Vancouver as in the past voltage has been low on the lines due to distance from substations. It is the purpose of the railway company to complete the station within six months.

## Bibliography of Colorado River Has Been Completed

A complete bibliography of the Colorado River and its tributaries has recently been prepared by the Riverside Public Library. This bibliography is a compilation of books, magazine articles and government documents in the library and has been prepared by Miss Bertha Walsworth, under the direction of Chas. M. Woods, librarian.

The problem of the development of the Colorado River is of supreme interest in the West and will continue until full economic development is completed. As the bibliography is newly finished, it contains the latest information on the subject.

**According to its secretary,** Clancy M. Lewis, the Manufacturers' Association of Washington will expend about $1,000,000 during 1923 in the establishment of a pulp and paper mill at Tumwater, Wash., near Olympia, on the site of a dismantled brewery which will become a part of the new mill. The West Coast Pulp & Paper Company, organized by the Hawley Pulp & Paper Company interests at Oregon City, will erect and operate the plant.

## May Start Work on Rio Grande Project Immediately

Actual construction of a project to cost in the neighborhood of $1,500,000, planned to develop hydroelectric power at the mouth of White Rock Canyon on the Rio Grande west of Santa Fe, N. M., can be started as soon as the associates of Daniel L. Evans, of Pottstown, Pa., are ready. The application filed with the state engineer of New Mexico by Mr. Evans has been approved and the permit which has been issued states that construction must be completed within a reasonable time.

According to the information furnished Charles A. May, state engineer, the plant is expected to develop 15,000 hp. and to be capable of supplying electricity for commercial use to Santa Fe, Las Vegas and Albuquerque. It is also indicated that there is a possibility of securing enough power to electrify the main line of the Atchison, Topeka & Santa Fe Railroad between Albuquerque and Las Vegas, or at least over the Glorieta grade.

Under the present plans it would be practical to transmit power to towns within a 250-mile radius of the generating plant. The dam proposed is to be at the mouth of the canyon and is to be 140 ft. high.

## Oregon Pulp and Paper Mill to Be Enlarged at Once

The Hawley Pulp & Paper Company of Oregon City, Ore., has announced its decision to start at once on the construction of a large addition to its plant located at the falls of the Willamette River. The increase in the plant, which will cost between $1,500,000 and $2,000,000, will include the building of an additional paper factory unit 100 x 400 ft., three stories in height, pulp grinding equipment and another sulphite mill. The additions will raise the capacity of the plant from 110 tons to approximately 190 tons every 24 hours, chiefly news print. About 200 additional men will be needed.

Plans for the new addition have been in the course of preparation for several months and as a result there will be little delay in getting started. The machines should be ready for operation in a year's time.

**Decision as to** whether the Pacific Gas & Electric Company will construct Pit No. 2 or Pit No. 3, next, will not be made until the spring months, according to P. M. Downing, vice-president in charge of electrical construction. Both plants are to be on the Pit River and will be below the Pit No. 1 plant opened Sept. 30. Pit No. 2 project will develop 15,000 kw. and will be located three miles down the stream from the first plant and Pit No. 3, still farther downstream, will have a capacity of 50,000 kw.

**The City of Murray,** Utah, has applied to the state engineer of Utah for authority to divert 15 sec.-ft. of water from Little Cottonwood creek in Salt Lake County. Two 5-ft. wheels are to be installed, and the horsepower generated is to be about 420. This additional power is proposed to increase the present output of the Murray City municipal electric plant.

## Injunction Sought to Prevent Power System Appraisal

A permanent injunction to prevent the City of Los Angeles securing the services of the California State Railroad Commission to obtain an appraisal of its lines has been requested by the Los Angeles Gas & Electric Company, on the grounds that the motion to have this appraisal made did not pass the city council by the required two-thirds majority. At the time the motion was before the council five votes were cast in favor of it and four councilmen were opposed to it.

The purpose of the city is to condemn the system of the power company within the city limits. According to figures of the company the system is worth $17,000,000, and the city officials state that it is worth only $7,000,000. The Los Angeles Gas & Electric Company now has many extensions under way and according to a statement by Champ Vance, vice-president of the company, the system will be worth $20,000,000 within another year.

## C. A. Coffin Fund Will Reward Service to Industry

By action of its board of directors, the General Electric Company has set aside a fund of $400,000 to be known as the Charles A. Coffin Foundation, the income from which, amounting to approximately $20,000 a year, will be available for encouraging and rewarding service in the electrical field by its employees, for giving recognition to lighting, power and railway companies for improvement in service and for fellowships to graduate students and funds for research work at technical schools and colleges.

The fund has been set aside by the General Electric Company as an appreciation of the work of Charles A. Coffin, who was the founder of the company and its leader for thirty years. Mr. Coffin has been identified with the development of the electrical industry since 1868 and retired from the General Electric Company May 16, of this year.

The committee controlling the fund proposes to distribute the income of the foundation as follows:

(1) Eleven thousand dollars in prizes for the most signal contributions by employees of the General Electric Company toward the increase of its efficiency or progress in the electrical art. Particularly, the prizes are to further encourage suggestions from workmen. With each prize, the company will give a certificate of award. Foremen's prizes are to be awarded for the best department, taking into account its appearance, efficiency of operation, and conditions which add to the better conduct of the work and the welfare of the employees.

(2) A gold medal, to be known as the "Charles A. Coffin Medal," will be awarded annually to the public utility operating company within the United States which, during the year, has made the greatest contribution towards increasing the advantages of the use of electric light and power for the convenience and well-being of the public and the benefit of the industry. The company receiving the medal will also receive $1,000 for its employees' benefit or similar fund.

A committee to be named by the National Electric Light Association and known as the Charles A. Coffin Prize Committee of the National Electric Light Association, which shall consist of its president, chairman of its public policy committee and a third member nominated by them, will award this medal, acting with the advice and cooperation of a committee appointed by the foundation committee.

(3) A gold medal, to be known as the "Charles A. Coffin Medal," will be awarded annually to the electric railway company within the United States which, during the year, has made the greatest contribution towards increasing the advantages of electric transportation for the convenience and well-being of the public and the benefit of the industry. The company receiving the medal will also receive $1,000 for its employees' benefit or similar fund.

A committee, formed in the same manner as the preceding one and to be named by the American Electric Railway Association and known as the "Charles A. Coffin Prize Committee of the American Electric Railway Association," will award this medal.

(4) Five thousand dollars is to be awarded annually for fellowships to graduates of American colleges and technical schools, or some portion or all of the fund may be used to further the research work, at any of the colleges or technical schools in the United States. The fields in which these fellowships and funds for research work are to be awarded are electricity, physics and physical chemistry.

In each annual report of the General Electric Company a statement will be made of the awards under the "Charles A. Coffin Foundation," and other publicity will be given to such awards.

The board of directors of the General Electric Company has appointed as the "Charles A. Coffin Foundation Committee" the following officers of the company: A. W. Burchard, J. R. Lovejoy, E. W. Rice, Jr., Gerard Swope and O. D. Young.

## Oregon Short Line Will Build Secondary Main Line

The Oregon Short Line railroad through Carl R. Gray, president, has signed a contract with the Chamber of Commerce of Boise to build a secondary main line from Orchard, Idaho, a station on the line about 25 miles east of Boise, into that town to operate through passenger trains over the proposed new route and into Nampa.

The Oregon Short Line agrees to expend $3,180,550 on building of the railroad and passenger station.

The City of Boise is to deed the right-of-way and raise a trust fund of $325,000, the interest on which is to be used to pay taxes on the newly constructed line for a period of 25 years.

**The Department of Conservation and Development** of the State of Washington has issued two permits to appropriate waters of creeks in Stevens County, one to Fred Mitchell for the Inchelium Water Power Company, to install a hydroelectric plant on Stranger Creek. The other permit is issued to Harry L. Lincoln of Metaline, to appropriate waters of Linton Creek.

## Concrete Conduit Will be Built in Southern California

A contract which has been under consideration for two or three years has just been completed and has been signed by Escondido Mutual Water Company of Escondido, Calif., and the San Diego County Water Company of San Diego, Calif. The contract deals with the construction and benefits of the Warner dam which will be up to the 110-ft. contour in about two months and will then have a capacity of approximately 164,000 acre-feet.

Under the provisions of the contract an immense concrete conduit will be built, including tunnels, and will utilize the present conduit of the Escondido Mutual Water Company on the San Luis Rey River to the Bear Valley reservoir about 6 miles east and north of Escondido. The new conduit when completed will deliver 45,000,000 gal. of water a day.

The Bear Valley reservoir will be strengthened next year and increased within two or three years. This reservoir will be used as a storage source by the Escondido Mutual Water Company and as a distributing center by the San Diego County Water Company. A power plant is also to be built, according to the terms of the contract, just above the Bear Valley reservoir, and will be owned by both companies. Through the contract thousands of acres in San Diego county, surrounding the town of Escondido, will be irrigated and the wealth of the territory will be greatly enhanced.

## Wholesale Power Not to Be Sold by Irrigation District

The Modesto-Turlock Irrigation District directors are opposed to wholesaling electric power to any city or community that may be served when the district installs its transmission lines from the Don Pedro dam. It is the purpose of the directors to retail the power generated at the dam and distributed by the transmission lines now under construction.

The city of Turlock, Calif., has already been refused power at wholesale rates. A recent application of the district asks for a franchise from the county board of supervisors of Merced county, for the erection of a transmission line and distributing system in the county enabling the district to sell electricity outside of the corporate limits of towns in Merced County lying north of the Merced River. The hearing will be held Dec. 22.

## Springfield, Ore., Sawmill to Be Completely Electrified

An order was recently placed with the General Electric Company for the electrical equipment of the Wendling sawmill of the Booth Kelly Lumber Company of Springfield, Ore. This mill, which replaces the one destroyed by fire last summer, is to be completely electrified. The contract includes a 300-hp. motor for the band head-saw, one of the same size for the edger and numerous smaller motors, in addition to necessary switchboard and central apparatus.

The Booth Kelly company will install an additional steam turbine to care for the new mill. The West Coast Engineering Company of Portland has been engaged for the electrical wiring.

## First Unit of Copper Company's Mill Being Reopened

After four years' suspension, one section of the Utah Copper Company's Magna, Utah, mill has been placed in operation, with a crew of about 400 men. Construction work is progressing in preparing other sections for operation, and it is expected that activity will gradually increase until all sections, about twelve in number, will soon be operating.

## California Cooperative Campaign Announces Xmas Plans

Plans for the launching of a whirlwind campaign in San Francisco and Los Angeles to promote the sale of electrical appliances as Christmas gifts, are being prepared by the California Electrical Cooperative Campaign as the result of a report of the activities of the San Diego Electric Club along similar lines made at the advisory committee meeting of the Campaign at the Hotel Coronado.

The campaign now under way in San Diego, as outlined by A. E. Holloway, superintendent of the commercial department of the San Diego Consolidated Gas & Electric Company, is centered around the slogan "Give Electrical Christmas Gifts." Individual and cooperative advertising is being run daily in the local papers to emphasize this idea. A total of 57 billboards have been utilized to carry the message, while automobile posters and window displays are also being used. One of the most novel features of the campaign is the 5,000 buttons bearing the slogan which have been distributed to the school children. Large replicas of these buttons will be worn by all members of the electrical fraternity.

## Editors Guests of Idaho Power Company for Three Days

Reports received from editors of a large number of papers throughout southern Idaho indicate that the trip recently conducted by the Idaho Power Company was one which interested these men greatly. As a result of the trip a healthy feeling of cooperation has been established between the central station company and the press.

Three days were devoted to the trip, which was conducted during the month of November and the power company played the part of the educational host well, according to comments by the editors who made the trip. The start was made from Boise, Idaho, and the first plant to be visited was the Swan Falls station south of the city. The visitors were then guests at the Idaho-Utah football game and on the following morning started for the Malad plant near Mountain Home and then visited the Lower Salmon plant a mile west of Hagerman. The Thousand Springs plant, the one at Shoshone Falls and the American Falls development were also viewed by the editorial guests. After reaching their destination at American Falls the guests were acquainted with the government plans for the $13,000,000 dam which will water a million and one-half acres.

# Books and Bulletins

### ADVANCED LABORATORY PRACTICE IN ELECTRICITY AND MAGNETISM

By EARLE MELVIN TERRY, PH. D., Associate Professor of Physics, University of Wisconsin. 6 x 9 in. 261 pages. 131 illustrations. $3. McGraw-Hill Book Company, Inc., New York.

In a laboratory manual for the use of engineering students, it is quite desirable that the scope of the experiments be extended to include the newer branches of electrical measurements in addition to the older and better established fields.

The author has compiled in this text the subject matter of such a course as given to the students in electrical engineering in one of our large universities and has combined the fundamentals of the old and the new in a very satisfactory manner. The system of preceding an experiment by a discussion of the theories involved and its relation to the other experiments in the same field is followed throughout. In addition, care has been taken to describe the equipment to be used and to explain the manner of making a measurement before it is attempted by the student.

The subject of elementary transient phenomena and its relation to complex bridge methods for the precise measurement of inductance and capacity is treated at length. Because of the multiplicity of its uses, the electron tube has many applications in the general research laboratory and in engineering work, besides its usefulness in the way of radio communication, therefore the author has devoted considerable space to this device. The interesting subject of the conduction of electricity through gases is well explained, and sufficient experiments in this advanced branch of physics are outlined to give the student a good working knowledge of the fundamentals.

The author has made use of mathematics wherever it is necessary to show the method of developing a formula concerning a particular experiment to be made.

This text is well adapted to the use of electrical engineering students taking the necessary advanced course in measurements in electricity and magnetism.

E. R. S.

### Six Place Tables

132 pages, 4 by 6¾ in. $1.25. McGraw-Hill Book Company, Inc., New York.

This is a compact, flexible volume containing a selection of tables of squares, cubes, square roots, cube roots, fifth roots and powers, circumferences and areas of circles, logarithms of numbers, logarithms of the trigonometric functions and the natural trigonometric functions. The tables are those most commonly needed by engineers and engineering students and the book should prove of great value because of compactness and the handy arrangement of the tables.

# Meetings

## Seattle Club Holds Banquet on Board Coastwise Vessel

Approximately 200 people, all directly or indirectly interested in the electrical industry in Seattle, Wash., were the guests of the Electric Club of Seattle at a banquet given aboard the S. S. H. F. Alexander on the evening of Nov. 27. The Admiral line vessel was moored to a pier in the harbor and the electrical men and their wives had no trouble in getting aboard.

Every chair in the dining salon of the vessel was occupied when the banquet was started and some of the late-comers were forced to participate only in the dancing and card party which followed the meal. All branches of the electrical industry in the Puget Sound city were well represented and guests remarked that it was one of the most successful events of its kind that has ever been held.

W. E. Jones, president of the club, presided at the banquet and was assisted by an entertainment committee composed of R. M. Coe, F. A. Block, Harry Martin, Charles Smutz and B. R. Stare.

## Denver League Aids Christmas Advertising Campaigns

A Christmas advertising campaign, somewhat smaller than that launched last year, is being conducted by the Electrical Cooperative League in Denver. An appropriation has been made, it is said, for advertisements appearing every day in the principal newspapers throughout the month of December up until Christmas. Special page spreads, in cooperation with the various electrical dealers, are being featured weekly.

The slogan, "Make This an Electrical Christmas," introduced last year, is again being used to good advantage. Advertising copy is being prepared by S. W. Bishop, executive manager of the League, assisted by Frank J. McEniry, the newly appointed field representative of that organization, who formerly was connected with the Denver newspapers.

**A Ladies' Meeting** was recently held by the Denver section of the American Institute of Electrical Engineers to which members of the organization and members of the constituent bodies of the Colorado Engineering Council and their wives were invited. During the evening a demonstration of telephone equipment was presented and a moving picture entitled "Behind Your Telephone" was also shown to the visitors.

**The Delta Electric & Water Company** withdrew its application for a permit to set poles and string wires in Everett, Wash., when it became evident that the permit sought would have to be granted as a franchise, with franchise requirements of two per cent of gross earnings payment to the city.

## Supply Jobbers Make Plans to Stabilize Industry

Steps toward stabilizing the electrical appliance business, and increasing its volume, were taken at the semi-annual convention of the Electrical Supply Jobbers' Association, held at the Hotel Cleveland, Cleveland, Ohio, Nov. 20-24. Out of town registration totaled 368.

Methods of helping the retail dealer to better fulfill his function in the chain of distribution was one of the outstanding subjects discussed. The necessity of increasing the number of regular dealers to adequately supply the public was also discussed, and suggestions were made that the spread between the wholesale and retail prices of electrical appliances at present is not adequate to properly support the selling organization necessary to cover this field.

In order to improve the standard and give proper encouragement to retail electrical stores a spread of 50 per cent instead of the present 37 per cent, was urged by John H. Gilchrist, vice-president of the Commonwealth Edison Company of Chicago.

The jobber should actively support the high grade dealer and discourage the low grade dealer for the benefit of the industry as a whole, according to W. R. Herstein, vice-president of the Electric Supply Company, of Memphis, Tenn.

Jobbers' salesmen have a primary function in promoting cooperative electrical leagues throughout the country for the purpose of putting over the "Electrify America" and "Do It Electrically" campaigns, W. E. Robertson, general manager of the Robertson-Cataract Electric Company, of Buffalo, N. Y., said. Jobbers should cooperate actively with every other branch of the industry in this work.

The convention unanimously passed a resolution that a committee of three be appointed to investigate and make recommendations for placing the retail market in the electrical field on as profitable a basis as those existing in other fields.

### COMING EVENTS

**National Council of Lighting Fixture Manufacturers—**
Annual Convention—Cleveland, Ohio
Jan. 15-20, 1923

**Lighting Fixture Dealers Society of America—**
Annual Convention—Cleveland, Ohio
Jan. 15-20, 1923

**American Institute of Electrical Engineers—**
Midwinter Convention—New York, N. Y.
Feb. 14-16, 1923

**Contractor-dealers** in Denver, Colo., through their association, staged a smoker the night of Dec. 11. A number of boxing bouts and wrestling matches, along with some vaudeville acts, made up the program. It was held in the auditorium of the Denver Tramway Company under the direction of J. W. Hancock, an active member of the association, and Alex Hibbard, secretary of that organization.

## Radio Equipment Standardization Purpose of Conference

The Bureau of Standards of the Department of Commerce has called a conference on radio standardization to be held on Jan. 12, in New York City. The desirability of calling a general conference on radio standardization has been apparent in many ways, and this call is issued by the Bureau of Standards at the specific request of the following associations and organizations: Institute of Radio Engineers, National Radio Chamber of Commerce, Radio Apparatus Section, Associated Manufacturers of Electrical Supplies, National Retail and Dry Goods Association, American Radio Relay League, and the Radio Corporation of America. These organizations have pointed out that there is need for greater uniformity in the methods of describing, rating, and testing the performance of radio apparatus.

Invitations are being issued to all of the national associations of an engineering and technical nature which are known to be interested in radio standardization. The representation of radio manufacturers will in general be through the trade associations of which they are members. While it is desired to make the conference thoroughly and broadly representative, it is expected that the organizations invited will limit their representation to one or two persons in order that the conference may be as effective as possible.

The purpose of the conference is to consider broadly (1) whether a formulation of standards for radio apparatus and service shall be made, (2) if so, what general classes of apparatus or service should be included, and (3) what procedure shall be recommended for carrying out the conclusions reached by the conference. If the conference decides that radio standards should be formulated, it is expected that they will be prepared with special consideration of the wide range of interests which are concerned with the subject, and that these standards may ultimately be adopted with the approval of the American Engineering Standards Committee as an American Standard.

## Executive Committee Light and Power Association Meets

A meeting of the executive committee of the technical section of the Northwest Electric Light and Power Association was called to order by Chairman R. M. Boykin, on Dec. 5, in the offices of J. B. Fisken, engineer with the Washington Water Power Company, at Spokane, Wash. The meeting was characterized by two days of solid work, those present forming a single group, and much helpful discussion resulted.

The following heads of committees were present: R. E. Thatcher, meters; J. B. Fisken, hydraulic power; H. H. Schoolfield, safety rules; and R. R. Robley, apparatus.

Several committee chairmen were unable to attend because of other important business. Their work was cared for by other members of the executive committee. The chairmen unable to be at the meeting were: H. R. Wakeman, underground; F. J. Rankin, overhead; O. L. Lefever, prime movers; and G. E. Quinan, inductive co-ordination.

# Personals

**Warren Stoutner**, member of the Public Utilities Commission of Utah, has returned to Salt Lake City from the recent convention of the National Association of Railway and Utility Commissioners, held at Detroit. Mr. Stoutner is chairman of the accounting committee of the national association. The report of his committee, on the subject of a uniform system of accounting for the various classes of utilities in several states, was one of the important matters discussed at the convention. He reports that Salt Lake City is very likely to get the 1924 convention of the national association.

**A. N. McI. Robertson**, of Punjab, India, with the Indian Service of the British empire, spent a few days in Salt Lake City during the latter part of November, studying irrigation works, methods and construction as applied to irrigation.

**J. S. Desmond**, petroleum chemist, U. S. Bureau of Mines, with headquarters at the San Francisco office of the Bureau, is at Pittsburgh, Penn., where he will remain several weeks gathering data in connection with cracking experiments being carried on by the Bureau.

**Harry L. Garbutt** has been appointed merchandising manager for the San Francisco office of the Westinghouse Electric & Manufacturing Company. Mr. Garbutt came to San Francisco in 1919 to become district supply manager for the Westinghouse company. Born at Port Huron, Mich., in 1879, Mr. Garbutt entered the electrical field at seventeen and for twelve years was engaged in overhead construction work in various middle western states. In 1908 he joined the organization of the Drew Electric & Manufacturing Company of Indianapolis where he remained as sales manager until becoming line material specialist with the Westinghouse company late in 1909. In 1913 he became manager of the line material section at East Pittsburgh, then six years later supply manager for the San Francisco territory, from which position he has recently been made manager of the newly organized merchandising division in the San Francisco office.

HARRY L. GARBUTT

**Douglas Betts**, chief engineer of Messrs. Debenhams, Ltd., electrical engineers of London, England, is a recent Pacific Coast visitor. Mr. Betts, who is a member of the American Institute of Electrical Engineers, is touring the United States for the purpose of investigating recent hydroelectric developments .

**W. M. Deming**, president of the Atlantic Pacific Radio Supply Company of San Francisco, has recently returned from a short eastern business trip.

**H. G. Weeks**, of the H. G. Weeks Manufacturing Company, Hamilton, Ohio, is a recent Pacific Coast visitor.

**R. B. Williamson**, electrical engineer of Milwaukee, recently spent several days in San Francisco, while investigating power development in California.

**W. H. Dow** of the Northern States Power Company, Minneapolis, Minn., is a recent San Francisco visitor.

**G. E. Emmons**, vice-president of the General Electric Company, Schenectady, N. Y., is making a tour of the Pacific Coast at the present time.

**H. Noel Pike** of the industrial sales department of the Los Angeles office, Westinghouse Electric & Manufacturing Company, has just recently been transferred to the sales department of the Tucson office of that company.

**F. C. Conrad**, Pacific Coast representative of the Square D Company, from San Francisco, has been in Los Angeles in the interests of his firm.

**E. P. Markee**, district manager, Edison Lamp Works, Los Angeles, recently visited San Francisco in the interests of his company.

**David Hays**, assistant manager of the wiring device division of the General Electric Company, Bridgeport, Conn., is in Los Angeles, after visiting various points on the Pacific Coast, and will remain until after the Jobbers' Convention at Coronado.

**W. E. Creed**, president of the Pacific Gas & Electric Company, is in the East on a short business trip.

**C. B. Merrick**, formerly in the inspection department of the San Joaquin Light & Power Corporation, has been placed in charge of the range department of the Valley Electrical Supply Company of Fresno.

**S. T. Dodd**, engineer for the General Electric Company, was the chief speaker at one of the dinners held in conjunction with the fall convention of the Association of Chinese and American Engineers in Peking. Mr. Dodd spoke on "The Electrification of Railways."

**F. S. Mills** has been appointed representative of the Illuminating Engineering Society in Los Angeles. Mr. Mills has recently been made director of the activities of the National X-Ray Reflector Company in the territory from Denver west, including the Hawaiian Islands.

**J. G. McCollom** of the Intermountain Electric Company, and **J. C. Painter** of the Capital Electric Company, recently staged a radio program before the Salt Lake section of the American Institute of Electrical Engineers.

**J. A. Kahn**, president of the Capitol Electric Company, jobbers of Salt Lake City, has been in Los Angeles for a few days, prior to his departure for the Pacific Coast Jobbers' Association convention at Coronado.

**LeRoy M. Pharis**, who for the past several years has been assistant to the chief engineer of the Utah Power & Light Company, has recently become associated with the Great Northern Power Company, with headquarters at Duluth, Minn. Mr. Pharis was graduated as an electrical engineer from Syracuse University in 1907. In that same year, immediately after his graduation, he became associated with the Telluride Power Company. He was actively connected with the early hydroelectric developments of that company in Utah, Idaho and Colorado. When the Utah Power & Light Company was organized, in 1912, he became a member of that organization, as a hydraulic engineer, and devoted considerable of his time in connection with the company's Grace, Idaho, hydroelectric development. He has served in the capacity of assistant to the chief engineer for the past five years. Mr. Pharis' new duties will consist of investigating and developing hydroelectric possibilities with the Great Northern Power Company.

LEROY M. PHARIS

**Clark Grove** of New York, treasurer of the Mine & Smelter Supply Company of Denver, recently spent several days in that city conferring with executives of the company.

**Tracy E. Bibbins**, president, and **Dave E. Harris**, vice-president and sales manager, both of Pacific States Electric Company, San Francisco, attended the jobbers' convention at Coronado.

**K. E. Van Kuran**, district manager, Westinghouse Electric & Manufactur- Company, **Percy H. Booth**, district manager, Edison Electric Appliance Company, **H. H. Walker**, electrical contractor, **W. L. Frost**, manager, commercial department, Southern California Edison Company, of Los Angeles, and **George Bigelow** of Riverside, members of the Advisory Committee, California Electrical Cooperative Campaign, recently left for Coronado where they attended the meeting of the Advisory Committee of the Campaign and also attended the Pacific Coast Jobbers' Association convention.

**Harry E. Koening** has been appointed lighting fixture specialist for the Illinois Electric Company. Mr. Koening has been with the National X-Ray Reflector Company of Chicago for the past eleven years and has been in the fixture business during his entire business career.

**W. C. Chappell,** noted English hydroelectric engineer, recently visited San Francisco en route from Australia to the East. Mr. Chappell is known in Australasia as the man who gave Tasmania its first electric lights and street cars. He supervised the construction of a 57,000-hp. hydro plant near Hobart, Tasmania, and later, as chief electrical engineer of the state electrical commission of Victoria, he was in charge of the erection of a steam plant at Melbourne.

**H. W. Hitchcock,** of the Pacific Telephone & Telegraph Company, read a highly interesting paper on "Carrier Current Telephone and Telegraph Systems" before a recent meeting of the San Francisco section of the American Institute of Electrical Engineers.

**G. E. Kimball,** electrical engineer for the California State Railroad Commission, will represent California on the committee on lighting legislation of the Illuminating Engineering Society of America.

**W. C. Sterne** of the Summit County (Colo.) Power Company, was re-elected chairman, **E. A. Phinney** of the Jefferson County (Colo.) Power & Light Company, vice-chairman, and **V. L. Board,** general superintendent of the Denver Gas & Electric Light Company, secretary and treasurer of the Rocky Mountain Committee on Public Utility Information for the new year, at the committee meeting Nov. 25. **George E. Lewis** was re-appointed executive manager.

**Paul B. Wilson** has been promoted to the post of district manager of the San Joaquin Light & Power Corporation at Fresno, Calif., to succeed **A. M. Frost,** who has been made sales manager of the company. Mr. Wilson was formerly district manager at Madera, having held that post since December, 1913. During that time his district has

PAUL B. WILSON

been the center of a tremendous agricultural growth in which the central station has played an important part. Mr. Wilson began his career with the company in August, 1909, as a counter man. In August, 1913, he was promoted to the position of district manager at Paso Robles and in December of the same year he was transferred to Madera.

**H. B. Cannon,** formerly agent of the San Joaquin division of the Pacific Gas & Electric Company at Newman, Calif., has been made electrical superintendent on the North Bay division with headquarters at Vallejo.

**John S. Elliott,** manager of the Coto-Coil Company of Providence, R. I., is a recent Pacific Coast visitor. Mr. Elliott is making a survey of the western market with a view of opening channels of distribution for his products in the West.

**J. H. Anderton,** member of the firm of Thebo, Starr and Anderton, San Francisco consulting engineers, recently gave an address before the Foreign Trade Club of San Francisco on the subject of industrial and electrical development in Japan. Mr. Anderton recently returned from Japan where his firm is engaged in supervising the development of several hydroelectric projects.

**Herbert C. Hoover,** Secretary of Commerce and chairman of the Colorado River Commission, spent several days at his home in Palo Alto, Calif., following the conclusion of the meetings of the commission at Santa Fe, N. M. During his stay Secretary Hoover delivered two addresses on the Colorado River, one before the San Francisco Chamber of Commerce and the other before the Commonwealth Club of the same city.

**B. Y. Gibson,** Pacific Coast representative of the Walker-Pratt Manufacturing Company, manufacturers of Western Electric-Crawford ranges, of San Francisco, is in Los Angeles for a considerable stay, going over the local territory with the Western Electric Company's representatives.

**Floyd Averill,** of the Fobes Supply Company of Portland, spent a few days in Los Angeles and San Francisco en route to the Jobbers' Convention at Coronado.

**Ray F. Robinson,** of the Robinson Sales Company of Seattle, was a recent business visitor in San Francisco. Mr. Robinson's firm is the representative in the Northwest for some of the most well known electrical manufacturers.

**H. D. Randall,** district manager of the General Electric Company in Denver, addressed the Rocky Mountain alumni association of the Delta Upsilon fraternity at its monthly meeting in Denver, Nov. 25.

**John J. Cooper,** chairman of the Electrical Cooperative League in Denver, has appointed as chairmen of the various standing committees of that organization: **George O. Hodgson,** district manager of the Edison Lamp Works, membership; **Clarence Keeler,** entertainment; **F. F. McCammon,** program; and **R. G. Gentry,** finance. Each of the last three named is connected with the Denver Gas & Electric Light Company.

**F. F. McCammon** of the Denver Gas & Electric Light Company, and **D. D. Sturgeon,** an active contractor-dealer, have been appointed to represent the electrical industry through the Electrical Cooperative League of Denver on the committee arranging for a pageant of progress to be staged in Denver some time this summer, as part of the "500,000 in 1930" campaign, sponsored by the real estate bureau of the Denver Civic and Commercial Association.

**Frank J. McEniry,** a prominent Denver newspaper man, has been appointed the field representative of the Electrical Cooperative League in that city. As one of the first steps in its new campaign of intensive business development, the League has secured Mr. McEniry's services and because of his

FRANK J. McENIRY

close contact with the electrical industry and his wide acquaintance, the League members feel, it is said, that the personal service idea of the organization will be greatly accelerated. Mr. McEniry is a graduate of the University of Denver and served overseas during the war as an officer in the Quartermaster Corps. He is vice-president of the Denver Press Club.

**H. T. Plumb,** district manager for the General Electric Company at Ogden, Utah, addressed a meeting of the Rotary Club in that city recently. Mr. Plumb's talk dealt with the history and development of radio and explained the principle upon which radio functions.

## Obituary

**Alfred E. Bent,** one of the pioneers of electrical development in Colorado and New Mexico, died at his home in Denver, Nov. 28, after a brief illness. He established several central station properties in the Askansas Valley of Colorado and his son, Donald E. Bent, president of the New Mexico Utilities Association, is the head of the Tucumcari Light & Power Company, another plant established by his father. Mr. Bent at the time of his death was 66 years old. He became a resident of Colorado in 1886 and took an active part in state politics from 1905 to 1909, during which time he served as state auditor and state treasurer. He made his residence in Denver after his retirement from politics.

**H. E. Corbet,** manager of the Los Angeles Service Station of the Edison Appliance Company for the past seven years, died on Thursday, Nov. 30, 1922. Mr. Corbet was one of the most valued employees of that company and was very active in local electrical circles and his passing was marked with regret by all electrical men in this section.

# Manufacturer, Dealer and Jobber Activities

**The Electrical Material Company,** with offices in San Francisco, Seattle, and Los Angeles, has recently been appointed the agent of the **Roller-Smith Company** in Washington and parts of Oregon and Idaho. The distributing company has recently opened offices in the Hinckley Building in Seattle and has placed R. F. Robinson in charge of this office. This company now has the agency for the Roller-Smith products all over the Pacific Coast region.

**The Edison Electric Appliance Company** has just perfected the new Edison Curling Iron, which it claims will give service far above any curler selling at anything near its price. Its heating unit consists of nickel chromium wire wound on a porcelain tube in which a steel rod has been inserted as a support. The unit is packed in a brass shell with magnesium oxide and cannot be damaged by ordinary falls or knocks. The new curler has an angle opening shield. All parts are heavily nickeled and buffed. The handle is of selected wood, properly insulated.

**The United Electric Company,** of Canton, Ohio, has published and sent to distributors and retailers of its line of Ohio-Tuec electric heaters, a number of suggestions for Christmas windows. A number of attractive window displays are described in the letter.

**The C. & S. Electric Company,** of Warren, Pa., has recently placed on the market an electric soapstone warmer. This is an old device which is now made to be electrically heated. A heating unit of 3,000 watts is embedded in the soapstone and when heated the warmer will hold the heat for a number of hours. It may be used either in a bed or as a foot warmer during the day, in automobiles, street cars or other places where continuous heat is needed.

**The Esterline-Angus Company,** of Indianapolis, Ind., manufacturers of graphic meters and permanent magnets, has recently published a new bulletin entitled "How to Make a Plant Survey." This bulletin gives information which will aid the engineer in making a plant survey and in getting records and applying them. Copies may be secured by addressing the manufacturers.

**The Goodnow-Gardner Electrical Corporation** has filed articles of incorporation in the state of Colorado. The new firm will engage in the general electrical business in Boulder, Colo. The incorporators are L. Goodnow, R. S. Gardner, and C. W. Bell.

**The Kauffman-Norton Company,** of San Francisco, is now acting as distributor for the Electrogas floor furnace.

**The California Wire Company,** of Orange, Calif., is at present turning out about a carload of wire a day at its southern California plant. Weatherproof wire is the chief product of the company and it is carrying in stock in San Francisco a supply of about 150,000 lb. of this. Insulating yarn is being made at the California Cordage Company mill which is a subsidiary of the wire company.

**The Arthur-Fowler Company,** manufacturers of A & F electric water heaters and accessories in Spokane, Wash., has entered into an agreement for the distribution of their entire product by the Washington Electric Supply Company of that city. No change in price of policy is contemplated, A & F goods being sold through regular jobbing channels as before.

**The Butte Electric Supply Company,** of Butte, Mont., has recently installed a retail department which will operate along side of the distributing organization which has been conducted by the firm for some time. The new department is to feature electric washers, sewing machines, cleaners and popular smaller appliances. Radio supplies will also be handled. Royal MacDonald, formerly of San Francisco, has been placed in charge of the retail department.

**Deming & Steel** is the firm name under which C. P. Deming and F. A. Steel will engage in the electrical engineering and contracting business at 622 Fourth Avenue, Seattle, the new firm specializing in design, estimating, supervision and installation. Mr. Deming came west 12 years ago to act as representative for Crocker-Wheeler Company and for the past seven years has been Northwest manager of the wire division of U. S. Rubber Company. Mr. Steel was formerly of J. J. Agutter & Company, and for 18 years has been engaged in electrical contracting and engineering business in Seattle.

**The Westinghouse Electric & Manufacturing Company** has reprinted an article that appeared recently in the technical press, on the "Advantages of Railroad Electrification," by R. J. O'Brien of its heavy traction department. The publication is known as reprint No. 128. In answer to the questions, "Why electrify?" and "What are the advantages of electrification?", statistics and data acquired from actual operating records on both steam and electric roads serve as a means of comparing the two methods of operation. These statistics touch on fuel consumption, maintenance costs, schedules possible under existing modes of transportation, and other subjects of importance. The feasibility of electric operation in tunnels, on heavy mountain grades, in congested freight yards, or in heavy interurban traffic are also clearly set forth.

**The Continental Electric Company** has been incorporated in Denver for the purpose of manufacturing and distributing a patented lighting unit. Adolph R. Stein and William E. Quiers are directing the company which has its offices in the Quincy Building. The patented feature of the unit is said to be in the composition of the glass reflector and shade to which has been added Kisselguhr.

**The Hendrie & Bolthoff Manufacturing & Supply Company** of Denver, through the manager of the electrical department, J. C. Davidson, has taken the lead in conducting a coopertive newspaper advertising campaign for the improvement of radio business in the Rocky Mountain region. Page spreads are appearing in the Denver newspapers weekly.

**The Black Electric Company,** of Denver, Colo., a closed corporation, has been incorporated in the State of Colorado to manufacture storage batteries on patents originally issued to the Fritchle Electric Company. Charles W. Owens, Samuel M. Palmer, William S. Black, and Frank McDonough, Jr., have incorporated the company for $10,000. The Denver factory is located at 1544 Clarkson Street.

**Charles Bolibaugh,** of 1462 Josephine Street, Denver, Colo., is the newest addition to the electrical business in the intermountain city. A license was recently issued to Mr. Bolibaugh, by the city's electrical department.

NEW PORTLAND HOME FOR WESTERN ELECTRIC COMPANY

**The new three-story brick and concrete building which has been constructed for the supply department of the Western Electric Company in Portland, Ore. The new home of the department occupies a 50 x 100-ft. lot on the northwest corner of West Park and Flanders Streets. The building was erected especially for the company and will be used by it for office and warehouse purposes.**

# Trade Outlook

## San Francisco

As a result of better conditions in interior towns making up the back country of San Francisco, conditions are considerably better than they were last year. Higher prices are being received for live stock and grain and large sums are being expended for mining operations and general construction. All of this is being felt in the business circles of San Francisco.

In some sections around San Francisco Bay, building permits have exceeded previous records. Real estate transactions in the city have been many during the year and for the first eight months the value of property sold totaled $88,000,000. No cessation has been noted in transactions lately.

Many merchants have reported that trade has shown substantial gains. Holiday shoppers have already started December sales climbing to respectable totals and later buyers will undoubtedly swell the volume by a much greater amount.

Electrical dealers as well as other merchants not engaged in the business are endeavoring to capitalize on the electrical idea placed in the public mind through the electrical homes displayed in their vicinity. Electrical toys are prominently displayed by department stores and many shop window displays are based around some device electrically operated.

Range sales have slowed up to some extent lately despite the actions of well-trained and experienced selling crews. Competition among manufacturers is keen.

The conduit situation has been relieved to some extent by the arrival of several carloads from eastern manufacturers, but jobbers' and dealers' racks are depleted of the smaller sizes.

## Seattle

Perhaps the most encouraging feature of the local situation is the fact that for the first time in months the transcontinental lines into Washington are able to promise relief from the car shortage which has prevented the marketing of much of this year's crops, and has hampered all lines of industry. Cars are coming west in increasing number, and while the supply is yet far below normal, there is basis for hope that the situation will be entirely relieved in the near future.

Building construction in Seattle continues unabated, and the month of November maintained the high building record for the year. To date, the total of building costs is more than $5,000,000 higher than for the same period in 1921. Residence building has been unusually active, creating a splendid demand for the better class of fixtures and devices throughout new homes, and a tendency on the part of the home-builder to be particular about this part of construction.

There is a continued demand for washers, with splendid prospects for holiday business. This condition also exists in vacuum cleaners and household appliances, particularly waffle irons, toasters, etc., to be used as gifts.

November demand for lamps show an increase over this period of 1921, with slightly decreased prices.

Ranges are moving well, the cost of installation as compared with gas ranges being overcome, because of delays by the gas company in making new extensions.

## Los Angeles

Building activity for the last fifteen days of November kept up with the remarkable rate that has been existing in this section for the past few years; during this period there were 28,093 permits issued with a valuation of $5,677,855, which represents an increase of approximately 25 per cent over the corresponding period of 1921 with 21,346 permits issued for a valuation of $4,342,787. The building total for the entire month was well in excess of eleven million dollars and represented an increase over the previous month.

Bank clearings for the last half of November amounted to $235,028,390.16 which compares with the same period of 1921, with $193,225,907.55 as an increase of approximately 20 per cent.

The sale of electrical appliances in this section and throughout southern California continues unabated and with increases expected. The retail trade for Christmas is expected to assume unheard-of proportions in the sale of both large and small electrical appliances. The only kick that is heard registered in these parts at the present time is the lack of stock on certain appliances. The distributors of washing machines report increased sales. The conduit situation in this section is materially improved, however, and the demand owing to the huge building program continues to exceed the supply.

Electrical supplies are also being sold at a tremendous rate and several large sales of large apparatus are expected in this territory soon. The motion picture industry is very active and is progressing in wonderful fashion, as is indicated by some of the larger producers recently adding materially to their electrical equipment.

The sale of radio apparatus has apparently recovered, for increased sales are reported all along the line and the Christmas trade is expected to swell the volume of radio sales materially.

## Portland

The general tone of business in and around Portland is good. Holiday buying is well started and in many lines is expected to far exceed 1921. This applies particularly to electric ranges, washers, cleaners and smaller household devices. Sales will be limited somewhat by the lack of stocks. Central station buying still continues to form a large part of jobbers' sales. The power companies are working large gangs on extensions to distributing systems.

In the lumber industry indications are very favorable. The year 1922 will probably be the greatest known to the lumber industry in the Northwest. Prices have recently advanced and the tendency is toward a still further increase. Orders from the Orient and Atlantic states show a good increase, and the building trades in general are still very active. The value of the residence building permits in Portland for the month of November were almost exactly what they were a year ago, but the value of all the other classes was 40 per cent ahead of 1921.

A big growth has been shown during the 11 months of this year in Portland's ocean shipments, the gain being 600,000 tons in both entrances and clearances over 1921. Portland's bank clearings for November, 1922, were $140,138 865 as compared with $128,828,504 of November a year ago.

## Salt Lake City

Throughout the intermountain territory business contiues to show signs of improvement, and there does not appear to be any good reason why gains should not continue to be made throughout the winter months.

The mines of Utah are continuing their production at a rapid rate, and some of them are running short-handed due to lack of men.

The farmers have harvested good crops, although they are faced with low prices for the products, and in addition a rather serious car shortage. However, their difficulties are growing less as time goes on. The sugar beet growers have had a prosperous season.

The approach of the winter season has slowed up building operations to some extent, although there is still considerable activity in finishing construction work.

Electrical dealers report a good holiday trade, and this, of course, is reflected in increased business for the jobbers. Merchants in general also report holiday business good.

## Denver

Improving business conditions are reflected in the optimism created by the ratification of the Colorado River pact, the supreme court decision upholding the constitutionality of the Moffat tunnel project, the raising of $625,000 for the first community chest, and a recently announced program of unprecedented building activity.

Electrical jobbers report increasing business attendant on Christmas buying. This is evidenced especially in radio sales developing from the co-operative advertising campaign of radio jobbers. Vacuum cleaner sales are picking up. Wiring devices and schedule materials are being quoted higher with good demand. Christmas tree lighting sets are amply stocked for the increasing demand that may prove equal to business developed last year in this line, it is believed.

# Construction News

## Buildings (Industrial)

**Calif., Long Beach**—Blue Tank Pipe Line & Refinery Company of Long Beach, has completed the purchase of a 15½-acre trace in Wilmington as a site for a refinery and pipe line base. Estimated cost, $900,000. The company owns wells in Signal Hill and will construct a 12-mile pipe line of 6½-in. diameter from the central storage farm to the new refinery.

**Calif., Long Beach**—Architect and Engineers Truesdell, Purinton & Newton, 304 San Fernando Building, have completed plans and are taking bids for a refrigerating plant to be installed in an ice cream plant being erected at Long Beach, for the Consumers Milk Company.

**Calif., Los Angeles**—Gay Engineering Corporation, 2659 Santa Fe Ave., has the contract to erect an ice plant on McCadden Place near Santa Monica Blvd. for National Ice & Cold Storage Company. One story, 216 x 67 ft., frame and corrugated iron construction, comp. roofing, structural steel, cork insulation, concrete floor; $35,000.

**Calif., Orange**—The Moran Co., 206 Kerckhoff Building are preparing plans and have the contract to erect a 1-story, reinforced concrete factory building in Orange, for the California Cordage Company. Dimensions, 100 x 140 ft., concrete exterior walls, basement, comp. roofing, concrete floors, steel sash, wire and plate glass; power to be furnished by electricity.

**Calif., San Bernardino** — W. C. Horne Construction Company, Los Angeles, was awarded contract to erect a wholesale building at Rialto and D Streets, for the Southern Terminal Warehouse and Storage Company. Structure will be 2-story with foundation suitable for two additional stories, of reinforced concrete construction throughout. Cost, $85,000.

**Calif., Santa Ana**—Shell Oil Company of California plans to establish a gas and oil storage plant and distributing station on the Santa Fe right-of-way. The plant, which will comprise offices, warehouses, garages, etc., will have a storage capacity of approximately 100,000 barrels.

**Calif., Los Angeles** — The Austin Company, Pacific Electric Building, has the contract to erect a 1-story and part 2-story building at the southeast corner of Washington St. and Stanford Ave., for W. Elmo Reavis. It will be 100 x 145 ft., steel frame and roof trusses, brick walls, comp. roofing, steel sash, metal skylights, cement and wood floors.

**Calif., Oakland**—Immediate construction of the factory and salesroom for the Hebern Elec. Code Co. will be undertaken. The building is to cost $300,000 and will be established on Harrison Street, from Eighth to Ninth. P. J. Walker is the builder; Reed & Corlett, architects.

**Calif., San Francisco**—Richard Hellman, Inc., nationally known manufacturing concern producing Blue Ribbon mayonnaise, will open a branch factory in San Francisco, erecting a building and equipping it at a cost of $250,000, according to announcement made by Chas. A. Day, director of the industrial department of the San Francisco Chamber of Commerce.

**Colo., Denver**—Within 30 days the McMurtry Manufacturing Company will erect a four-story fireproof warehouse adjoining the present factory of the company. W. R. McFarland, the president of the company, reports that it will cost about $60,000. As soon as this unit is completed, it is understood that a similar structure will be built as a glass warehouse.

**Ore., Portland**—The Pacific Fruit & Produce Company will erect an $80,000 concrete building for wholesale and jobbing purposes. The building will be on East 2nd Street between Washington and Alder Streets, and will be 100 x 200 ft., one story, full basement and mezzanine floor, equipped with cold storage facilities.

**Ore., Portland**—A two-story cold storage plant will be added to the National Cold Storage & Ice Company plant, costing about $80,000. about $80,000.

**Wash., Seattle**—The Washington Iron Works has completed plans for the immediate erection of a new gray iron and steel foundry building at 1500 Sixth Avenue South, to cost $90,000. The building will be 660 x 130 ft., of steel frame construction, equipped with electrical traveling cranes and complete foundry equipment.

**Wash., Edmonds** — Preliminary surveys are being completed for the new half-million dollar storage plant of the Union Oil Company, to be erected at Edmonds. Two large loading piers, and several large tanks are included in the work.

**Wash., Spokane** — The Cranston-Brewer box factory, destroyed by fire recently with a loss of $40,000, is to be rebuilt, the new plant to have all modern improvements and to have enlarged capacity.

**Wash., Aberdeen**—A two-story warehouse is to be built for A. A. Star Transfer Company at Hume and K Streets and will cost $45,000.

**Wash., Seattle**—The Elliott Bay Mill Company plans the construction of a new planing mill at West Spokane Street yard. The building will be 95 x 50 ft., of heavy mill construction.

**Wash., Hoquiam**—S. P. Mitchel has acquired a site here on which will be erected a factory for the manufacture of baskets, clothespins, broom and mop handles. Mr. Mitchel is president of the Mitchel Manufacturing Company of Dayton, Ohio.

**Wash., Centralia**—The H. M. Martin Lumber Company is progressing rapidly on the construction of its new sawmill, which will replace the plant destroyed by fire. The new plant will cost $100,000 and will have a capacity of 100,000 ft. daily, and will be electrically driven throughout.

## Buildings (Miscellaneous)

**Calif., Los Angeles**—Architects Allison & Allison, 1405 Hibernian Bldg., have been commissioned to prepare plans for a 4-story and basement class A department store building at Hollywood Blvd. and Vine St. for Dr. E. O. Palmer. It will be occupied by Broadway Bros. of Pasadena and Hollywood. It will be designed for 6-story slab, brick filled walls, press. brick and terra cotta facing, plate glass, marble and tile work, steel sash, elevators, plumbing, wiring, heating; $300,000.

**Calif., Pasadena—Schools** — Architects Allison & Allison, 1405 Hibernian Bldg., have been authorized to proceed with plans for additional buildings at the Washington school site, on Monk Hill, Pasadena. The bonds have been sold. The buildings will include an auditorium, study hall, class rooms, cafeteria and manual arts department; brick construction; $200,000.

**Calif., Fresno**—R. F. Felchin & Co., Bank of Italy Bldg., announce a change in the plans for the new Patterson Building, making it an eight-story structure for its entire J St. frontage, 175 ft., instead of for only 75 ft., with the balance three stories as originally planned. This additional work will cost $200,000, making the total cost of the building $1,350,000.

**Calif., Selma — School** — Olcester & Potter, Yuma, Ariz., were awarded the general contract at $185,300 for erecting a new science building at high school site at Selma, Fresno County; Norman F. Marsh, 211 Broadway Central Bldg., architect. The building will be 3-story, 151 x 141 ft., reinforced concrete construction, stucco exterior, comp. roofing, cast stone trim, metal skylights, pine trim, steam heating.

**Calif., Fullerton—School** — Architect Carleton M. Winslor, 1134 Van Nuys Bldg., is preparing plans for a new science building at Fullerton High School and Junior College. One-story and part 2-story, basement for heating plant only, 280 x 45 ft., concrete and brick construction, stucco exterior, wood or reinforced concrete, comp. roofing, mastic flooring, quarry tile floors in corridors. Work will also include arcades connecting present science buildings, which will form wings to new buildings.

**Calif., San Francisco — Apartments** — Plans have been prepared by Henry H. Gutterson, architect, for a community building to be erected on the northwest corner of Sacramento and Mason Streets, at a cost of approximately $1,000,000, including the site. The structure will be a class A, steel frame building and plans call for five, ten and fifteen to eighteen-room apartments. Clinton Construction Co., contractors.

**Calif., Fresno—Bank—Offices**—The Fidelity of Fresno branch of the Pacific Northwest Trust and Savings Bank has announced that a new 15-story building is to be erected on Mariposa and J Streets at a cost of $1,000,000. Construction work will start in 90 days. The building will contain over 200 offices.

**Calif., Fresno—Offices**—The Sun Maid Raisin Growers have made arrangements with Holland & Holland to lease a new two-story building on L Street. The building will contain an area of 6¼ acres and will cost approximately $160,000.

**Calif., Fresno—Store**—The Fresno Hardware Company has announced a plan for erecting a 4-story building on North J. Street at a cost of approximately $230,000.

**Calif., Pasadena—Store** — Architect Frederick Kennedy, Jr., 429 Chamber of Commerce Building, Pasadena, is preparing plans for a $50,000 1-story store building to be erected by Contractor Rowell at the southeast corner of Colorado St. and Los Robles Ave., Pasadena, for Ernest H. Lockwood. Foundation 104 x 185 ft., cement and wood floors, tile toilets and floors, brick and reinforced concrete walls, art stone facing, comp. roofing, steel sash, skylights, plate glass windows.

**Calif., Altadena—Store**—Karl J. Moller, 375 Del Monte St., Pasadena, has the contract for erecting a $30,000 1-story, 5-room store building at Mariposa and Lake Sts., Altadena, for F. E. Nelson. B. G. Horton, 750 E. Colorado St., Pasadena, architect. Foundation 130 x 75 ft., brick walls, enameled brick trim, terra cotta coping, cement floors, plate glass windows, comp. roofing.

**Calif., San Francisco—Garage** — A concrete one-story garage to cost approximately $75,000 will be erected on the north side of 14th Street, east of Mission, by A. E. Perley.

**Calif., San Francisco—Garage**—A, three-story and basement building is being erected by Louis R. Lurie on Polk Street near Sacramento, to cost in the neighborhood of $175,000. It will be occupied as a garage, automobile accessories store and automobile paint shop.

**Calif., Woodland—School**—At a recent election here school bonds amounting to $90,000 were voted on favorably for a school building at Esparato. Contract will be awarded and construction work started at an early date, as it is hoped to have the building ready for the opening of the new school year in Sept., 1923.

**Calif., San Francisco—Lodge**—A contract for the construction of a $100,000 hall for the San Francisco Lodge, Loyal Order of Moose, has been awarded to F. L. Hansen. The building, located at Market and Brady Streets, will be two stories high, of steel and concrete.

**Calif., San Francisco—Hotel**—The addition of a $400,000 unit to the Whitcomb Hotel has been announced by D. M. Linnard, lessee of the hotel. The new unit will add 400 rooms. MacDonald & Kahn, contractors, will start work immediately. Other units will be added at a later date.

**Calif., San Francisco—Offices**—Construction on the Western State Life Building will start early next year. It will be erected at Sixth and Stevenson Streets, just south of the company's present office building. It is planned to throw both buildings together in order to take advantage of a greatly increased floor space. Plans for the new building are in the hands of Reid Bros., architects.

**Calif., Bakersfield—Hospital**—Bids are being received by Board of Supervisors of Kern County for erecting four buildings with connecting tunnels for Kern general hospital group; Chas. H. Biggar, 405 Bank of Italy Building, Bakersfield, architect. Bids will be taken separately on general contract, excavating, grading and backfilling, plumbing, heating and ventilating, electrical work, elevators, painting, alternate bid on cement concrete brick, refrigeration plant and boxes, kitchen equipment, laundry machinery. Buildings will be of reinforced concrete and hollow tile construction with plaster exteriors and tile roofs. The cost is estimated at about $500,000.

**Calif., Pomona—Bank**—Architects Curlett & Beelman, 408 Union Bank Building, have completed plans for a 5-story, mezzanine story and basement, class A bank and office building to be erected at Pomona for the First National Bank of that city.

**Calif., Chino — Schools — Architects** John C. Austin, 1125 Baker-Detwiler Bldg., and Geo. M. Lindsay, Glendale, assoc., are completing plans for two new grammar schools at Chino. Buildings will contain 8 rooms each; reinforced concrete construction, plaster exterior, clay tile roofs, pine trim, beech floors. Bids will be advertised in about a week. Bonds in the sum of $117,000 have been voted.

**Calif., Los Angeles—Club**—The L. A. Athletic Club has purchased the St. Vincent's church property at northwest corner of Washington St. and Grand Ave. as a site for a new and larger club building.

**Calif., San Francisco—Schools—Relief Home**—At an election held on Nov. 21 school bonds totaling $12,000,000 and Relief Home bonds totaling $2,000,000 carried by a large majority. The building program of the board of education contemplates the construction of 30 new schools in all parts of the city, the purchase of additional playground space wherever necessary and expansion of present schools where needed. A comprehensive survey will be started immediately as a basis for a definite plan of rebuilding and expanding. Construction of the first school will probably begin in about a year and bonds will be sold from time to time as the funds are needed. Plans for the new relief home were prepared by Reidmeyer & Howard in 1913. There will be 10 buildings in the group, all to be of the pavilion type, two to four stories in height. Industrial shops have been provided for and in addition there will be a social hall, reading room and chapel. Building will begin about September, 1923. C. N. Wollenberg is superintendent of the relief home.

**Calif., Los Angeles—Hotel**—Architect A. C. Martin, 430 Higgins Building, is preparing plans for a 3-story class C hotel building on San Pedro St., near 7th St., for N. Canepa; 4 stores, 50 rooms and 4 baths. Brick walls, 65 x 100 ft., pressed brick front, pine and cement floors, O.P. trim, plate glass, copper store fronts, tiled baths, steam heating system, water heating system, fire escapes; $50,000.

**Calif., Santa Monica—School**—Architects Allison & Allison, 1405 Hibernian Building, are completing plans for new Lincoln junior high school at Santa Monica. The entire project will cost about $350,000. The main building will be erected at present at a cost of $200,000. It will be 2-story, brick construction, cement plaster exterior, tile and comp. roof, pine trim, maple floors, reinforced concrete stairways and corridors.

**Calif., Los Angeles—Club**—Architects Allison & Allison, 1405 Hibernian Bldg., are completing plans for the new clubhouse for Friday Morning Club to be erected on Figueroa St., between 9th and 10th Sts. The building will be 6 stories, class A reinforced concrete construction, steel trusses, stone facing for first two stories, cement plaster exterior and stone trim above, hardwood trim, elevators, etc.; $500,000.

**Calif., Hollywood—Hospital**—Architect Robert H. Orr, 1305 Van Nuys Building, has completed plans for the new hospital building to be erected on Vermont Ave. near Sunset Blvd., for Hollywood Hospital Assn. Five stories, reinforced concrete construction, main section, 192 x 40 ft., with a wing, 60 x 40 ft.; training school, emergency hospital, dining room and culinary dept. in the first story, executive offices, X-ray dept., maternity dept., operating rooms and rooms for 150 beds in upper stories; stucco exterior, tile and comp. roof, solariums, marble and tile work, steam heating, vacuum cleaning, refrigeration system, 2 elevators; $300,000. Bids will be taken shortly.

**Calif., Santa Barbara—Offices—Stores**—Architects L. L. Maiyberry, 472 Pacific Electric Bldg., and Kirkhuff & Schaaf, Santa Barbara, assoc., are preparing plans for a 4-story class A addition to the San Marcos Building at Santa Barbara for Hawley estate. It will be 42 x 125 ft. with stores in first story and about 60 offices above; reinforced concrete construction, stucco exterior, comp. roof, plate glass, birch trim, steam heat, compressed air, archrib system of concrete construction, enlargement of present heating plant; $125,000.

**Calif., Napa—Sanitarium**—A hospital, to be known as the Atlas Peak Sanitarium, will be established near Capell Valley, seven miles from Napa, by a company recently incorporated for $300,000. Dr. C. H. Bulson is head of the company. Construction will start next spring.

**Calif., Long Beach — Bank** — Lange & Bergstrom, Washington Building, have been awarded the general contract at about $130,000 for erecting a class A bank building at southeast corner of 4th St. and Pine Ave., Long Beach, for First National Bank of that city. It will have a banking room, 75 x 120 ft., and a 3-story section, 55 x 75 ft.; basement under entire building; steel frame construction, brick walls, terra cotta facing, plate glass, reinforced concrete floors, marble and tile work, bronze grilles, passenger and service elevators, vaults. John Parkinson and Donald B. Parkinson, 420 Title Insurance Building, architects.

**Calif., Fresno—Lodge** — Architect Carl Werner, Santa Fe Building, San Francisco, has been commissioned to prepare plans for a five-story class B Scottish Rite Cathedral costing $500,000 for Scottish Rite Free Masons, at Stanislaus and L Sts. The Masons of Fresno have just purchased this site, 125 x 150 ft., and instead of spending $250,000 for a temple for the old site, as planned, will expend doub'e the amount on a cathedral that will include blue lodge, auditorium to seat 1,000, banquet hall, lodge rooms and stores. Plans will be ready to start work in January.

**Calif., Rialto—Bank**—Work will start at once on the foundations for the new Citizens National Bank Building at N. Riverside Ave. and West First St. It will be of brick and concrete with stone effect exterior, 30 x 73 ft., with lobby, rest room, deposit vaults, directors' room, etc.

**Calif., Santa Barbara—School**—Architects W. H. Weeks, San Francisco, and Sauter & Lockard, Santa Barbara, have completed their preliminary plans for the new Santa Barbara high school. Excavation will start this month. The total cost of the completed project will be defrayed by the $450,000 bond issue voted last March. Advertisement for bids for excavating has been authorized.

**Calif., South Pasadena — Store** — Architects Marston & Van Pelt, Edgar L. Maybury, assoc., 600 Chamber of Commerce Bldg., Pasadena, are preparing plans for a 2-story English store and theater building to be erected at the corner of Monterey Road and Fair Oaks Ave., South Pasadena. The theater will be operated by Jack Root of Pasadena. Three stores on the ground floor.

**Calif., Los Angeles—Bank**—Architects Walker & Eisen, 325 Pacific Finance Building, are preparing plans for a 1-story brick bank and store building at 46th St. and Western Ave. for the California Bank. It will contain a branch banking room and a store; dimensions 35 x 80 ft., brick walls, terra cotta facing, plate glass, steel beams, comp. roofing, cement floor, vaults.

**Calif., Redondo** — A. D. Adkinson has been awarded contract by Redondo Hardware Company to build a two-story brick building on Pacific Avenue, north of the Langer Building.

**Calif., Visalia**—Trewitt & Shields, Fresno, have started excavating for a 5-story bank building to be erected in Visalia for the Bank of Italy. Contract for the general work has not been awarded. Estimated cost, $265,000.

**Calif., Santa Ana—School**—County supervisers will purchase at once 18 acres on N. Flower St., north of Santiago Creek, as a site for a parental school. The school will comprise buildings to be erected by the county, for the care of delinquent children. J. M. Backs, county clerk.

**Calif., Modesto—School**—Ground for the first unit of the proposed junior college, costing $75,000, is expected to be broken about Feb. 1.

**Calif., Santa Barbara—City Hall**—Architects Sauter & Lockard will complete plans for new city hall building in six weeks. The revision of plans made necessary by lack of funds is under way. The cost has been reduced to $160,000. At its next meeting the council will decide whether segregated bids or complete bids or both will be called.

**Calif., Burbank—Schools**—Richardson Building & Engineering Company, 1126 Story Building, was awarded the contract at $19,680 and $19,200, respectively, for erecting new Joaquin Miller and Abraham Lincoln elementary schools at Burbank. Buildings will contain 4 rooms each; frame and plaster construction, shingle roofs.

**Calif., Redwood City—School** — Robert Trost, of San Francisco, has been awarded the contract for constructing the Sequoia Union High School for $210,704.

**Calif., San Francisco — Gymnasium** — Plans have been announced by the Young Men's Institute for the erection of a gymnasium building of four stories and basement, to be erected on Oak Street, adjoining the present Institute Building; cost, $150,000. Shea & Shea, architects.

**Calif., Orange—Homes**—Central Lemon Growers Assn. will expend approximately $30,000 to erect about 30 homes for Mexican workers and families. The buildings will be placed on a 4½-acre tract directly east of the packing plant.

**Calif., San Pedro—Stores—Offices**—C. H. Patterson plans to build a 2-story brick business block, 50 x 100 ft., at northeast corner of Sixth and Mesa Streets. Cost, about $50,000.

**Calif., Pomona—Banks** — Two bank buildings are planned for Pomona. One of these is the First National Bank's new building for which plans have been prepared and for which bids will be called as soon as the directors have approved them. The other is the American National Bank Building at Second and Garey Sts. The latter building will be 2-story, containing bank on ground floor with offices above.

**Calif., Long Beach—City Hall**—C. T. McGrew & Sons, 1345 West Ocean Ave., Long Beach, were low bidders and were awarded the contract at $117,433 for cement finishing four floors and basement, hollow tile partitions, painting, plumbing and wiring, in completing the new city hall building in Long Beach. Ralston Iron Works, San Francisco, agents for the Pauly Jail Cell Co. of St. Louis, was awarded the jail cell contract at $30,370 on an addition of $1,360 for using special steel.

**Calif., Los Angeles — Apartments**—Architects Walker & Eisen, 325 Pacific Finance Building, have been commissioned to prepare plans for a 13-story and basement class A apartment house to be erected at the corner of Kenmore Ave. and Wilshire Blvd. for Paul B. Fletcher and J. B. Lilly, 3rd St. and Western Ave. The site is 155 x 150 ft.; the building will contain about 425 rooms, reinforced concrete construction, pressed brick and terra cotta exterior, fire escapes, marble and tile work, wall beds, steam heat, refrigerating system, vacuum cleaning, elevators, etc.; $1,250,000.

**Calif., Los Angeles—Apartments** — Architects Russell & Alpaugh, 1106 Story Building, have completed plans and are taking bids for erecting an 8-story class A apartment house at Wilshire Blvd. and Carondolet St. for Wilshire-Carondolet Holding Company. It will contain 376 rooms, 188 apartments; lobby, ballroom and locker room; dimensions, 135 x 155 ft., reinforced concrete construction, pressed brick and cast stone exterior, hardwood trim, marble and tile work, steam heating, wall beds, 2 passenger elevators, vacuum cleaning, refrigerating system; $700,000. Bids are being taken separately on general contracting, heating, plumbing, wiring, vacuum cleaning, refrigeration, painting and elevators.

**Calif., Huntington Beach**—E. Kutzner, Huntington Beach, was low bidder at $44,150 on the general contract for erecting new city hall building at Huntington Beach; Walker & Eisen, 325 Pacific Finance Building, architects.

**Calif., Los Angeles—Offices** —A. C. Blumenthal, Loew State Building, representing a syndicate of San Francisco capitalists, has purchased Mercantile Place property, extending from Broadway to Spring Street, between 5th and 6th Streets, and is having sketches prepared by Los Angeles and San Francisco architects for contemplated improvements. It is the intention of the new owners to erect a 12-story class A office building, 50 x 120 ft. on each of the Broadway and Spring St. frontages, to be connected with a 3-story structure to be subdivided into shops. The property is 120 x 326 ft. in size. MacDonald & Kahn, Loew State Building, will be the contractors for the new buildings and work will be started as soon as present leases expire which will be in three months.

**Calif., Monrovia—Hotel**—Harold Bruce Dunn, 137 So. White Oak Ave., Monrovia, has been commissioned to prepare plans for a $600,000 class A group of hotel buildings to be erected on Gold Hill at the head of Myrtle Ave., Monrovia, in reproduction of the Indian architecture cliff dwellers settlement in New Mexico, for the Cliff Dwellers Inn Co. Arthur B. Benton, 1548 Sunset Blvd., Los Angeles, consulting architect. The main and supplementary canyon side buildings will be reinforced concrete construction. Main building will be 4 stories, 450 ft. front and 60 ft. deep, containing 100 guest rooms each with bath, dining rooms, lobby, basement. Secondary group will be of 20 buildings, to contain 10 to 20 rooms each with baths in each room. Other buildings of brick, tile and adobe construction, will include 50 tepees each with bath, 50 wigwams each with bath, hot water heating system plant in separate building, swimming pool 50 x 250 ft., bath house, Mission chapel 50 x 100 ft. at top of group with organ, roof garden. There will be an exterior incline elevator from bottom to top of canyon.

**Calif., Los Angeles—Apartments** — Architects Monaco & Bordeaux, 913 Bank of Italy Building, are preparing plans for a class C apartment building to contain 70 single apartments and large lobby, at Gower Ave. and Franklin Blvd., for C. A. Keeler. Brick walls, 3-story, plaster exterior, cast stone entrance and trim, tile baths and drainboards, battleship linoleum, hardwood floors, marble work; inter-telephone system, tile and composition roofing, gas steam radiator heating, wrought iron balconies, 1 automatic electric elevator, hardwood and O.P. trim; $175,000.

**Calif., Fresno—Salesroom—Garage**—Walter M. Murphy Motors Co. will build an automobile salesroom and garage building at Ventura and Van Ness Streets. Estimated cost $100,000. One-story, 145 x 140 ft. Equipment will cost about $50,000.

**Calif., Los Angeles—Offices**—Architects Dodd & Richards, 905 Brack-Shops Building, are preparing plans for an 8-story and basement class A office building, to be erected at the corner of 6th and Lucas Streets, for physicians' offices exclusively. It will be erected by a cooperative company being organized by Dr. Hill Hastings and associates. It will be 55 x 100 ft., reinforced concrete construction, and will have all modern equipment.

**Calif., El Centro — Court House** — Architects Don Wells and Ralph Swearington are completing plans and specifications for the $300,000 court house for Imperial County. It is expected to get work under way within 90 days.

**Calif., Los Angeles—Offices**—Architects Morgan, Walls & Morgan, 1124 Van Nuys Building, are preparing working drawings for a 5-story class A building at the plant of the L. A. Soap Company on East 1st St., near Alameda St. It will be a combination office and warehouse building, 60 x 270 ft., reinforced concrete construction, plaster exterior, steel sash, steel rolling doors, elevators, etc.

**Calif., Los Angeles—Stores—Offices**—Bavin & Burch Company, 173 E Jefferson St., have been awarded the general contract at about $115,000 for erecting a 6-story and basement class A store and office building at southeast corner of 6th and Lebanon Sts., for W. W. Paden and John L. Richardson. Excavation has been completed under separate contract and plumbing and elevators will be let separately. Total cost, $155,000. Chas. M. Hutchison, 427 Security Bldg., architect.

**Calif., Los Angeles—Offices**—Architect Roy L. Smith, 804 Higgins Building, has been commissioned to prepare plans and specifications for a 12-story and basement class A office building at northeast corner of Eighth and Spring Streets, for a syndicate represented by Joe Toplitzky, H. W. Hellman Building. The building will have a frontage of 51 ft. on Spring and Main Sts. and 120 ft. on 8th St. It will be of reinforced concrete construction with pressed brick and terra cotta exterior.

**Calif., San Diego—Institution** — Architect W. Templeton Johnson, 508 Timkin Building, is preparing plans for a building to be erected at Seventh and A Sts., to be occupied by the Associated Charities. The ground area is 100 x 100 ft. The cost of the building—$40,000—is to be defrayed by money donated by Miss Ellen B. Scripps for this purpose.

**Calif., Santa Barbara—City Hall**—Architects Sauter & Lockard have completed sketches for new city hall. The designs have been approved but call for an expenditure of $175,000, or $25,000 more than available. It is undecided whether this sum can be found to carry out the architects' ideas. The design is in the shape of a capital T, the crossbar fronting on DeLaGuerra St. and being 2-story of Spanish Colonial type, with tiled roof. A portion of the building will be used for police headquarters.

**Calif., San Diego—Studios**—Grading and excavating for S. L. Studios-San Diego, the new film organization preparing to build motion picture plant at Grossmont, have been completed and actual construction work will start at once. The first stage to be erected will be 90 x 256 ft., 40 ft. high. This is the first of a 10-unit plant to be erected. E. J. Shulter, technical director. Arthur H. Sawyer is president, and George D. Baker, director general.

**Calif., Santa Barbara—School**—Santa Barbara high school board will advertise for bids within a few weeks for construction of a group of new high school buildings for which plans have been completed by Architect William H. Weeks, 369 Pine St., San Francisco. Plans have been approved. The group as planned will cost about $350,000.

**Calif., Fresno—Store**—R. F. Felchin Company, architects and engineers, have secured a permit for the erection of the 3-story business building which is to be built by Hugh Sparkman for the Barker Bros. Furniture Company. Estimated cost, $105,000.

**Calif., Los Angeles—Hotel** — Architect J. A. Larralde, 1401 Stock Exchange Building, has prepared preliminary plans for a 9-story class A hotel building at northwest corner of Cherokee Ave. and Hollywood Blvd., for Geo. M. Hull and Gordon L. Friedman, 320 Chapman Bldg. Dimensions, 105 x 90 ft., 250 rooms, each with private bath, two elevators; probably reinforced concrete construction; $300,000. Negotiations for a tenant are under way.

**Calif., Riverside—Salesrooms** — C. A. Dundas (Glenwood Mission Garage) plans to build a new salesroom for the Studebaker agency on West 7th St., opposite his present location. It will be 70 x 35 ft., plate glass, special lighting and display fixtures, concrete floors, etc., to complete first-class salesroom and garage building. Total cost estimated at $50,000.

**Calif., Long Beach—Apartments**—Fred Butterfield, designer and builder, Long Beach, is completing plans for a 4-story frame apartment building to be erected at the corner of Chestnut Ave. and 4th St., Long Beach, for a cooperative selling group headed by Val Lester. Forty-seven apartments; stucco exterior, comp. roof, solarium, automatic elevator, radio room, social hall, community kitchen, dumb waiters, showers, incinerators, disappearing beds, tile baths, billiard room, central heating and refrigerating plants, plate glass windows, electric laundry.

**Calif., Los Angeles—Apartments**—Scofield Engineering Construction Company, Pacific Finance Building, has been awarded a contract on a percentage basis for erecting a 4-story and basement class C apartment house at the corner of Cahuenga Ave. and Hollywood Blvd. for Leach Cross. Walker & Eisen, 325 Pacific Finance Building, architects. The building will contain 172 rooms, 90 apartments; 100 x 160 ft., brick walls, pressed brick facing, cast stone trim, comp. roofing, pine and hardwood interior trim and floors, marble and tile work, two elevators, wall beds, tile bathrooms, steam heating; $350,000. The project was financed by S. W. Straus & Company, Merchants National Bank Building.

**Calif., Fresno—Stores—Offices**—R. F. Felchin & Co., Bank of Italy Building, have completed plans for a 2-story and office building to be erected at L and Fresno Streets, Fresno, for Holland Bros. The ground floor will contain stores and the second story, offices.

Nº 1

OF A SERIES OF ARTICLES PICTURING THE INFLUENCE OF THE ENGINEER IN THE AFFAIRS OF THE WORLD. PRESENTED BY THE McGRAW-HILL COMPANY, INC., WHOSE PUBLICATIONS HAVE SERVED THE ENGINEER THROUGH HALF A CENTURY OF INDUSTRIAL PROGRESS

*Coal Age*

*Electrical World*

*Electrical Merchandising*

*American Machinist*

*Industrial Engineer* (Published in Chicago)

*Engineering and Mining Journal-Press*

*American Machinist* European Edition (London)

# THE PLACE OF THE ENGINEER

WITHIN the memory of the elders of today this nation has turned from a land of scattered agriculturists to a compact unit of industrial production. And this in the face of a multiplying population with multiplying food requirements; in the face of increased acreage with increase output per acre.

¶ The change has come through the coming of a body of men known as engineers, who have delivered us from the consuming losses of chance by giving us the science of controlled and directed effort.

¶ These engineers have reduced the proportionate population of the farms through providing the farmer with mechanical means of replacing human labor.

¶ They gave industry impetus through providing it with equipment designed to construct the machinery and other devices required by the farmer, as well as to meet the enlarged needs of a congesting urban population.

¶ They have put machinery to do the drudgery of detail in office, store, factory, farm and home. They have put methods into management, facts where guess-work had been, knowledge where ignorance had taken toll.

¶ These engineers, of whom we hear so little and upon whom we are daily becoming more dependent, have carried out a successful and constructive revolution which has turned this country into the greatest of industrial nations.

¶ Today they are making themselves felt in the reconstruction of our standards of intercourse, in the improvement of both social and industrial laws, in the betterment of ethical and moral principles.

¶ They have earned this position of influence through having analyzed the purpose of life and through the evolution of a science of progress founded upon fact.

¶ You will do well to follow the activities of the engineer. Your future depends upon him, not merely your financial success but the revaluation of our world and its progress out of chaos into sound prosperity.

*Power*

*Engineering News-Record*

*Bus Transportation*

*Electric Railway Journal*

*Ingenieria Internacional* (Printed in Spanish)

*Chemical and Metallurgical Engineering*

*Journal of Electricity and Western Industry* (San Francisco)

McGRAW-HILL COMPANY · INC ·

NEW YORK

# ENGINEERS OF BUSINESS

## The Public Accountants

AND you will do well to consider another group of men whose activities are comparable to those of the engineer and whose work is the deduction of Facts from Figures, and the practical, timely and systematic application of those Facts in industry and business—the Public Accountants—Engineers of Business.

Organization, System, Method, Control, irresistible factors which determine the value of success, depend upon their service.

Theirs the power to make figures talk, telling of *things as they are*. They the guides, and the guards to progressive action. Thru their efforts, Ignorance, Gamble and Guess are eliminated; Mistakes, Inefficiency and Waste disappear; Profit is assured, and Loss prevented.

The cornerstone of Credit is their *Complete Audit*.

Their monthly *Balance Sheets* and *Operating Statements*, and above all, their *Business Budget*, are the safeguards against Over-Production, Over-Expansion and Over-Expenditure.

They have made *Cost Accounting* a science—and absolutely necessary to manufacturing success.

*Inventory* troubles are cleared by their simple *Systems*.

Sales Promotion is blind without their *Scientific Market Analysis*.

*Tax Problems* seem to settle themselves thru their practical knowledge of the law and their understanding of figures.

While their *Business Graphics* put before the executive a moving picture of his business activities.

## ERNST & ERNST

**AUDITS — SYSTEMS — TAX SERVICE**

**A National Organization with offices in 36 of the Largest Cities.**

No 2

OF A SERIES OF ARTICLES PICTURING THE INFLUENCE OF THE ENGINEER IN THE AFFAIRS OF THE WORLD. PRESENTED BY THE McGRAW-HILL COMPANY, INC, WHOSE PUBLICATIONS HAVE SERVED THE ENGINEER THROUGH HALF A CENTURY OF INDUSTRIAL PROGRESS

*Coal Age*

*Electrical World*

*Electrical Merchandising*

*American Machinist*

*Industrial Engineer* (Published in Chicago)

*Engineering and Mining Journal-Press*

*American Machinist* European Edition (London)

# THE ECONOMY OF KNOWLEDGE

ONE of the greatest needs of the world today is for accuracy. Accuracy in its teachings, in its actions, in its beliefs. This can only come through a knowledge of economic facts.

¶ A man may learn to drive a nail precisely, but he is a dangerous man unless he knows the effect of the driving upon the materials into which the nail enters. Progress requires an exactness of information to meet the needs of this day when no man is independent of his fellows. Without this exactness, this accuracy, efforts at advancement are endangered, and progress becomes speculative.

¶ The great dependency of the world upon its industrial organization, not alone for comforts but for the very vitals of life, dictates that haphazard be replaced by knowledge.

¶ Industry exacts known values and processes for its operation. And there we have the potent reason for the ever-increasing supremacy of the engineer. But a few years ago, when demand paid whatever price was required, industry threw itself into a fury of production and thought this passing whirl-wind of effort was progress.

¶ The cost of this effort has put the world in pawn, and our pride of achievement has been pricked by the sharp point of reality. We *thought* we were right. It did not require the engineer to prove we were wrong. The inevitable backward swing of the balance did that.

¶ But it has necessitated the service of the engineer to show us wherein we were wrong; and how to set about reconstruction on the sound basis of facts.

¶ At a costly price industry now recognizes its need of the engineer; his judgments, his analyses, his technical knowledge founded on economic facts.

¶ And progress is now following the trails blazed by the engineer for the benefit of all men; for the engineer has proved the economy of knowledge.

*Power*

*Engineering News-Record*

*Bus Transportation*

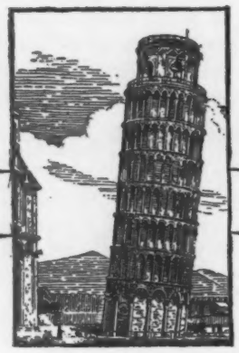
*Electric Railway Journal*

*Ingenieria Internacional* (Printed in Spanish)

*Chemical and Metallurgical Engineering*

*Journal of Electricity and Western Industry* (San Francisco)

McGRAW-HILL COMPANY · INC ·
NEW YORK



TOWER OF PISA

# IPSE DIXIT *and* GALILEO

There was much learning but little real knowledge in Galileo's time (1564-1642). Aristotle was swallowed in bad Latin translations. Ipse dixit. No one checked him by what seemed vulgar, coarse experiment.

Galileo fought against the dead hand of tradition. He did not argue about Aristotle, but put him to the test. Aristotle led his readers to believe that of two bodies the heavier will fall the faster. Galileo simply climbed to the top of the Leaning Tower of Pisa and dropped two unequal weights. The "best people" were horrified; they even refused to believe the result—that the weights reached the ground in equal times.

"Look at the world, and experiment, experiment," cried Galileo.

The biggest man in the 16th century was not Galileo in popular estimation, but Suleiman the Magnificent, the Ottoman Emperor, who swept through Eastern Europe with fire and sword and almost captured Vienna. Where is his magnificence now?

Galileo gave us science—established the paramount right of experimental evidence. Suleiman did little to help the world.

Hardly an experiment is made in modern science, which does not apply Galileo's results. When, for instance, the physicists in the Research Laboratories of the General Electric Company study the motions of electrons in rarified atmospheres, or experiment to heighten the efficiency of generators and motors, they follow Galileo's example and substitute facts for beliefs.

General Electric Company

*General Office* *Schenectady, N.Y.*

05-627-H D

RELY ON LOS ANGELES SEATTLE SAN FRANCISCO SERVICE

*Recognized as the Standard*

# BURNLEY

*Absolutely non-corrosive*

SOLDERING PASTE SOLDERING SALTS

SOLDERING STICKS

*In convenient sized containers*
*Always Ready*

BURNLEY BATTERY & MFG. CO.
NORTH EAST, PA., U. S. A.

*Pacific Coast Distributers*

## Baker-Joslyn Company

330-332 Azusa St.
LOS ANGELES

183-199 First Street
SAN FRANCISCO

2424-28 First Avenue South
SEATTLE

# A Little Journey with Rockbestos

## CHAPTER IV

*Wherein it develops that asbestos is largely responsible for taking dynamos and electric motors out of the class of "delicate mechanisms" and adding them to the "heavy duty machinery" list.*

WE came to a stop before another machine—"For insulating smaller sizes of Fixture Wire," explained Mr. M____ briefly.

"You'll find a wide difference in opinion about these types also," he continued. "Cords to be used for lamps which generate a good deal of heat are insulated directly with asbestos. An over-braiding of silk or cotton gives the finish. The asbestos is a sure check to heat from the lamps and protects the conductor from flame or heat from other sources. Remember this when you need wire for any table, desk or floor lamps.

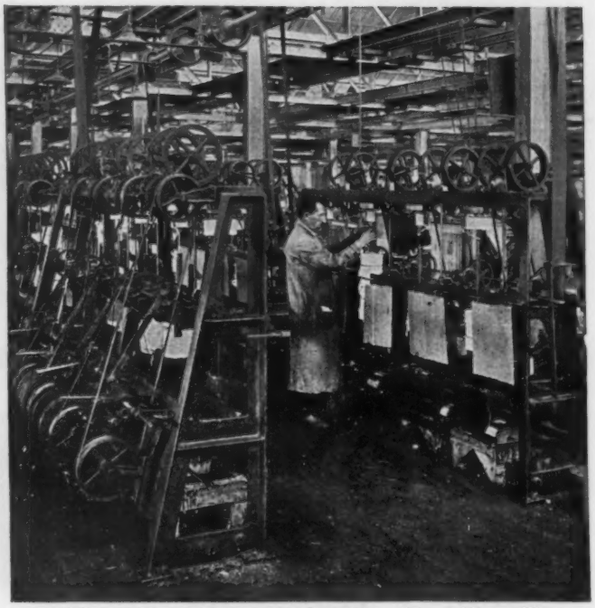
*Here's the machine shop. Year in and year out constant experiment is going on in this room to turn out machines that will improve the product.*

"And then there's magnet wire — another big field," he went on.

"A short time ago the dynamo and electric motor were rated as delicate bits of special mechanism.

"Today we find electric motors in all odd corners, doing work at which other types of motive apparatus balk. We find them whirring along in damp, dust and dirt. An occasional filling of the grease cups is all the care they get. But they run—and go on running.

"The rated capacity of a motor is the maximum power it can be counted on to develop continuously without causing over-heating. This power is recognized as less than the final capacity of the electrical features of the apparatus. We find that most motors can handle an intermittent overload—can exert more effort for a brief interval. This is limited by the length of time that elapses before temperature reaches the danger point. And most motors are many times a day subjected to such over-loading—it's all in their day's work.



*These machines insulate the smaller sizes of Magnet Wire and Fixture Wire with Rockbestos.*

"When other features of a motor are up to standard, insulation is the element that determines the rating of the machine. Here asbestos stands supreme. No insulation so resistant to heat—no insulation of comparable merit—has yet been found. Such sturdy insulation is doubly important when your motor is subjected to great external heat in iron foundries, blast furnaces and mines. Of course it costs a trifle more; but that difference is negligible when you stop to think that it is insurance against rewinding —a mighty expensive proposition."

Our feet were dragging a bit by this time, but we plugged on, making short stops before various ingenious machines.

* * * *

*Next month Chapter V will appear in this publication. An especially interesting account of an exceptional method of insuring quality will be described. Don't fail to look for it!*

*Plant of Rockbestos Products Corporation, New Haven, Conn.*

HEATER CORD
MAGNET WIRE
STOVE WIRE

Baker-Joslyn Company
Los Angeles San Francisco Seattle
*Pacific Coast Agents for*
ROCKBESTOS PRODUCTS CORPORATION, NEW HAVEN, CONN.

FIXTURE WIRE
SWITCHBOARD WIRE
MOTION PICTURE CABLE

# What Brings a Customer Back to YOU for Future Purchases

*"Not just orders, goods, and shipments, but satisfactory adjustment of all kinds of little troubles is what gives a house the sort of business personality that assures growth and success."*

R. H. Longfellow
*Service Department*

**For CENTRAL STATIONS, DEALERS and CONTRACTORS, RAILWAYS, INDUSTRIAL PLANTS and TELEPHONE COMPANIES**

EVERYBODY expects the daily run of orders and shipments to go thru without particular attention; and when once organized, it usually operates quite successfully. But it's not the success of that routine alone which makes a man prefer to deal with you rather than your competitor.

When troubles arise—delays, mistakes, losses, and the like,—then comes the test of your business personality, which will either keep or lose the customer. We have adopted the slogan, "The House that SERVICE Built," because it tells you what you may expect from us at all times—and we have a separate Department to carry out our policy of fair and square adjustment.

You can call upon our Service Department and get real results; orders not acknowledged, a shipment you haven't received, invoices delayed, charges incorrect—that's when you want service that will get action, and we're prepared to give it to you.

A growing business and a host of friends are convincing proof that our methods fulfill both spirit and letter of our slogan.

Our large stocks include a complete line of standard nationally advertised electrical and automotive supplies, among which are included:

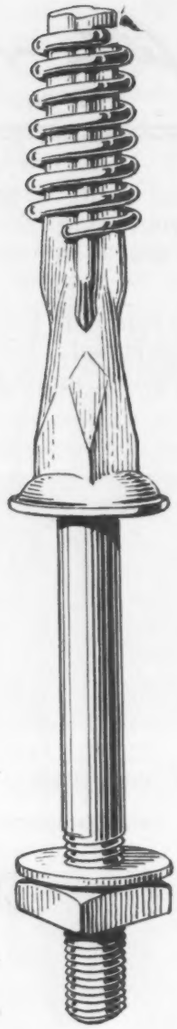
**Emerson Fans and Motors**
**National Metal Molding**
**Bryant Wiring Devices**
**Union Renewable Fuses**
**Phillips Wires and Cables**
**Crouse-Hinds Condulets**
**Packard Transformers**
**Hotwat Water Heaters**
**Simplex Ironing Machines**
**Eden and Universal Washing Machines**
**A C and Champion Spark Plugs**
**Thermoid Brake Linings**
**American Hammered Piston Rings**
**Gilfillan Ignition Parts**

## Electric Appliance Company

**807 Mission Street** **San Francisco**

**"The House that SERVICE built"**

"HUBBARD MAKES THE HARDWARE
THE HARDWARE MAKES THE LINE"



# *The Peirce Spring Thread Insulator Pin*

The latest **Peirce Spring Thread** insulator pin represents the highest development of that type of insulator pin. In it we have overcome the difficulties first encountered in spring thread pins. Its superiority will be apparent to the expert, for the following reasons:

(1) The Peirce Spring Thread provides a **flexible** seat for the insulator without the use of cement or solid iron.
(2) Being flexible it cushions the insulator from shocks.
(3) The insulator is unaffected by temperature changes because it is held by the Peirce Spring Thread, rather than by cement or solid iron.
(4) It is amply strong for all pin type insulators.
(5) It is protected by the Hubbard double dip, hot galvanized process — a process that shows the use of clean tanks, good workmanship and reliable materials.
(6) It is made from pure iron—not junk or scrap iron—manufactured at the Hubbard plant and is consequently flawless.

## HUBBARD & COMPANY

Pittsburgh, Pa.

Quality Electrical Merchandise
THE MARK THAT MEANS INSPECTED & GUARANTEED by PACIFIC STATES ELECTRIC COMPANY
Chosen from the Markets of the World

T. M. Reg. 1921

## PACIFIC STATES ELECTRIC COMPANY

SAN FRANCISCO LOS ANGELES OAKLAND PORTLAND SEATTLE SPOKANE

*Distributors for the Pacific Coast*

# LOCKE INSULATORS

*Manufactured by*

## LOCKE INSULATOR CORPORATION

VICTOR, NEW YORK

T. M. Reg. 1921

PACIFIC STATES
ELECTRIC COMPANY

SAN FRANCISCO LOS ANGELES OAKLAND PORTLAND SEATTLE SPOKANE

*Exclusive Pacific Coast Sales Agents*

T. M. Reg. 1921

# Anaconda-

*meets the most rigid transmission requirements.*

*What more can you ask?*

*"From Ore to Finished Product," in one Plant. Prompt and reliable deliveries to all Pacific Coast centers.*

EVERY inch of Anaconda Wire and Strand must conform to the most rigid transmission standards.

It has high conductivity—97.5% or better and can be drawn to meet any specifications which the customer may require.

As a result of its high conductivity Anaconda Wire reduces kilowatt loss in transmission.

Because of the strategic geographical location of the Anaconda plant orders are filled promptly; our unexcelled shipping facilities insuring quick and reliable deliveries to all Pacific Coast points.

These are some of the principal reasons why Pacific Coast lines of highest voltage are equipped with Anaconda.

**ANACONDA COPPER MINING COMPANY**

**Rolling Mills Department**
**111 W. Washington Street**
**Chicago, Ill.**

Quality Electrical Merchandise
THE MARK THAT MEANS INSPECTED & CERTIFIED by PACIFIC STATES ELECTRIC COMPANY
Chosen from the Markets of the World

T. M. Reg. 1921

PACIFIC STATES
ELECTRIC COMPANY

SAN FRANCISCO LOS ANGELES OAKLAND PORTLAND SEATTLE

*Distributors for the Pacific Coast*

# Sturdy as an Oak

Defiant to the storm the sturdy oak stands unbowed before the stresses and strains of wind and rain.

So does the new type D-22 with its rigid frame construction—insuring permanent contact alignment—withstand in service the stresses accompanying the rupture of high power circuits.

It's a bigger D-12.

**CONDIT ELECTRICAL MFG. CO.**

*Manufacturers of Electrical Protective Devices*

**Boston 27, Mass.**

Represented by the H. B. Squires Co. in Seattle, San Francisco and Los Angeles

122-46

## D-22

*SPECIFICATIONS: 15,000 Volts; 2, 3 or 4 Poles; Standard Ratings up to 1200 Amperes; Manually or Electrically Operated; Interrupting Capacity 2000 Amperes at 15,000 Volts. Laminated Contacts on All Sizes.*

CONDIT

# Protect the "Devil Dogs"!

**What is it worth to safeguard the lives of the men who work around high tension power transmission?**

BRAVE as the Marines are the men who keep the switchboards, substations and transmission of America's high power lines in operation and free from trouble.

So valuable are these men that every accident is an economic loss hard to replace.

That is a forceful reason why Plant Engineers, Contractors, Executives and Purchasing Agents are specifying equipment and apparatus designed by specialists in high tension practice.

Electric Power Equipment Corporation qualify as authorities in such equipment because every piece of material they put out has been designed from practical experience in building and installing high voltage generating and substations, switchboards and line construction.

The ELPECO trademark—the Crusader with two shields—stands for Protection to Life and Property and Prevention of Loss Thru Leaky Equipment.

**It costs little to specify ELPECO. It is worth much!**

**Indoor Bus Supports**

All material passes special high tension test. Tongues centered and offset to equalize stresses. Metal parts cemented to porcelain. No low temperature flowing metals. Interchangeable mounting base-pipe or flat—adjustable for any bus position.

**Indoor Disconnecting Switches**

Hinge and contact specially ground-in for perfect contact surface. All double blade construction.

**Indoor Switchboard and Structural Fittings**

Designed for interchangeability and clean construction.

**Outdoor Disconnecting Switches**

All truss-type blades. Soft brass head clamps shaping to insulator head, non-crushing. 45-degree switches equipped with heavy H section pins. Upright and inverted switches with X section pins. Special direct-acting patented latch for outdoor lock. No spiral springs. No hinges. Non-rusting. All outdoor apparatus mounted on hot-dipped galvanized channel iron sections. All outdoor steel equipment hot-dipped galvanized.

**Choke Coils**

All 25,000 volt service and over fitted with longitudinal braces. No distortion under short circuit.

**Copper Fittings**

High grade copper castings micrometer machined for shrink fit.

**Control Switches**

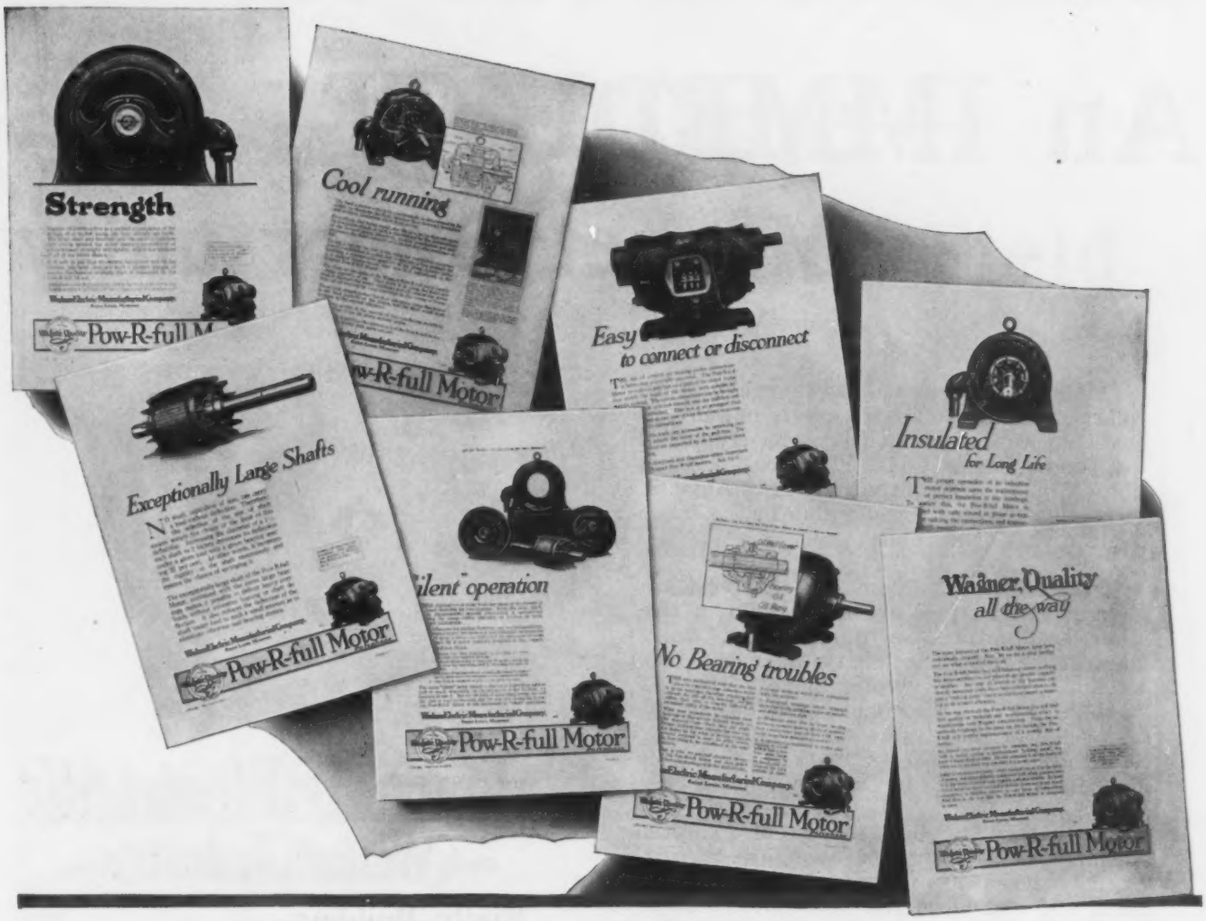
Specially designed for positive action preventing accidental throwing. Both lamp and mechanical indication. Protection from all hazards to operator.

**Pole Top Switches**

Circuit opened positively with no destructive effect upon the system. All phases broken simultaneously. Applies greatest pressure at point of contact with smallest stress at insulator.

ELECTRIC POWER EQUIPMENT CORPORATION, Philadelphia, Pa.

Western Representatives: C. E. INGALLS, Rialto Bldg., San Francisco, Cal.; FREDERICK G. SIMPSON, 3301 L. C. Smith Bldg., Seattle, Wash.




# These features please motor users

Why shouldn't they? For each and every one of them is the result of a demand on the part of these same motor users.

For over ten years our men in the field have been gathering data on what motor users want and the Pow-R-full Motor supplies them all.

These features are just what you want in your motor. Bulletin 12914 describes and illustrates many important features of Wagner Pow-R-full motors. Ask for it.

**Wagner Electric Manufacturing Company,**
**Saint Louis, Missouri**

2614

Wagner Quality **Pow-R-full Motor** *Polyphase*

# An IMMEDIATE
## Market Opportunity

Plans for the actual development of an enlarged market to absorb excess power now available were unanimously agreed upon at the recent Pacific Coast Electrical Association (N. E. L. A.) Convention in Los Angeles. Increasing current consumption in the home offers a vast opportunity.

Over 85% of the homes of the West are already wired; rates are lower than in any other section of the country; and many housewives make electricity their constant servant. To give greater impetus to the "home electrical" idea it has been decided to first sell the entire personnel of the power companies themselves—a market of 21,000 immediate prospects in California alone.

To further stimulate the use of domestic appliances, the power companies are making special inducements in prices, terms of payment, and cost of current; so that the campaign will reach every part of the West. Do you realize the sales possibilities involved?

**Journal of Electricity and Western Industry**

**Rialto Building**

**New York City**
**Geo. H. Duffield**
**10th Ave. at 36th St.**

**Philadelphia**
**Robert F. Beard**
**Real Estate Trust Bldg.**

# NOW Is the Time—

## Reach the Entire Field

A potential sales force of thousands of employes of the many power companies of the West is ready to serve in the double capacity of purchaser of appliances and promoter of further sales. Here is an opportunity to develop immediate business among individuals who are in direct contact with the entire electrical-buying public.

The Journal of Electricity and Western Industry offers an exceptional opportunity to every manufacturer of domestic appliances, as well as jobbers and contractor-dealers, to reach this entire specialized market. Approximately 98% of the official, executive, engineering, and commercial personnel of the power companies of the Far Western States are "Journal" readers.

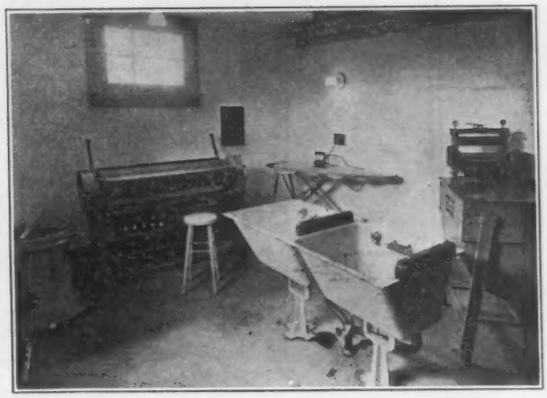
Take advantage of the initial drive of this activity to develop increased power-consumption in home, office, and shop. Reach the entire field of interested prospects—get in touch with the nearest representative of the "Journal"—now.

**Journal of Electricity and Western Industry**

**San Francisco**

**St. Louis**
**Malcolm E. Herring**
**713 Star Bldg.**

**Chicago**
**Albert Hauptli, Jr.**
**1570 Old Colony Bldg.**



View from above No. 5 Dam showing gate stands and control during construction. Insert shows detail of installation with gates in open position.

# COFFIN SLUICE GATES

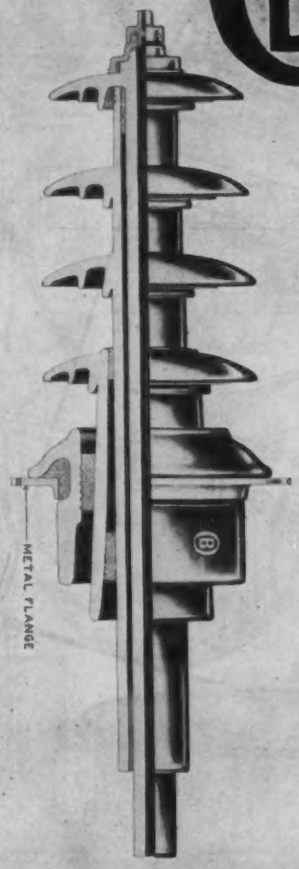
**have been installed to control the flow thru Dam No. 5 of the Big Creek No. 8 project of the Southern California Edison Company. These gates, weighing 3 tons each, are 72″ in diameter and are operated by electric motor.**

**Makers of the largest sluice and gate valves in America**

**COFFIN VALVE COMPANY**

**THEO F. DREDGE, Monadnock Building, San Francisco**

***Western Representative***




# Putting a three dimensioned job on O-B Insulators

Besides electrical insulation there are two other important functions which O-B Station Insulators perform well.

One of these is ability to carry mechanical strain which is often severe, at least momentarily.

And the other thing that O-B Insulators do well is FIT. Particular care is taken in designing O-B Station Insulators to keep them compact and in assembling them to follow exact specifications.

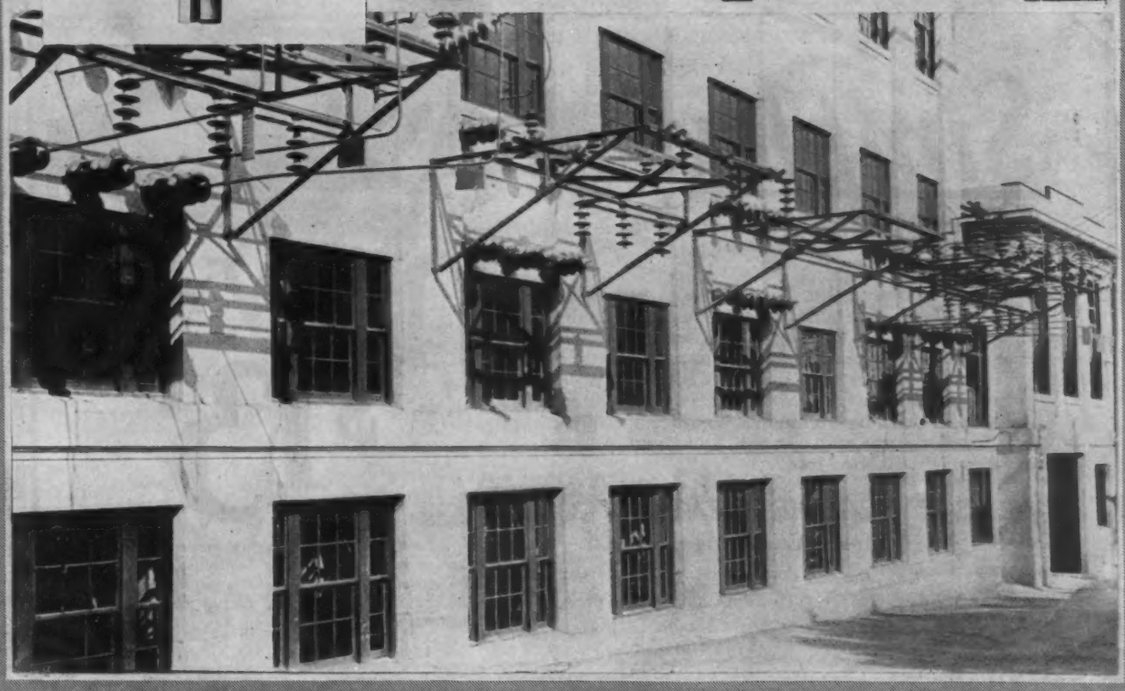
There is a large variety of standard and special O-B Insulators for station use.

## THE OHIO BRASS COMPANY

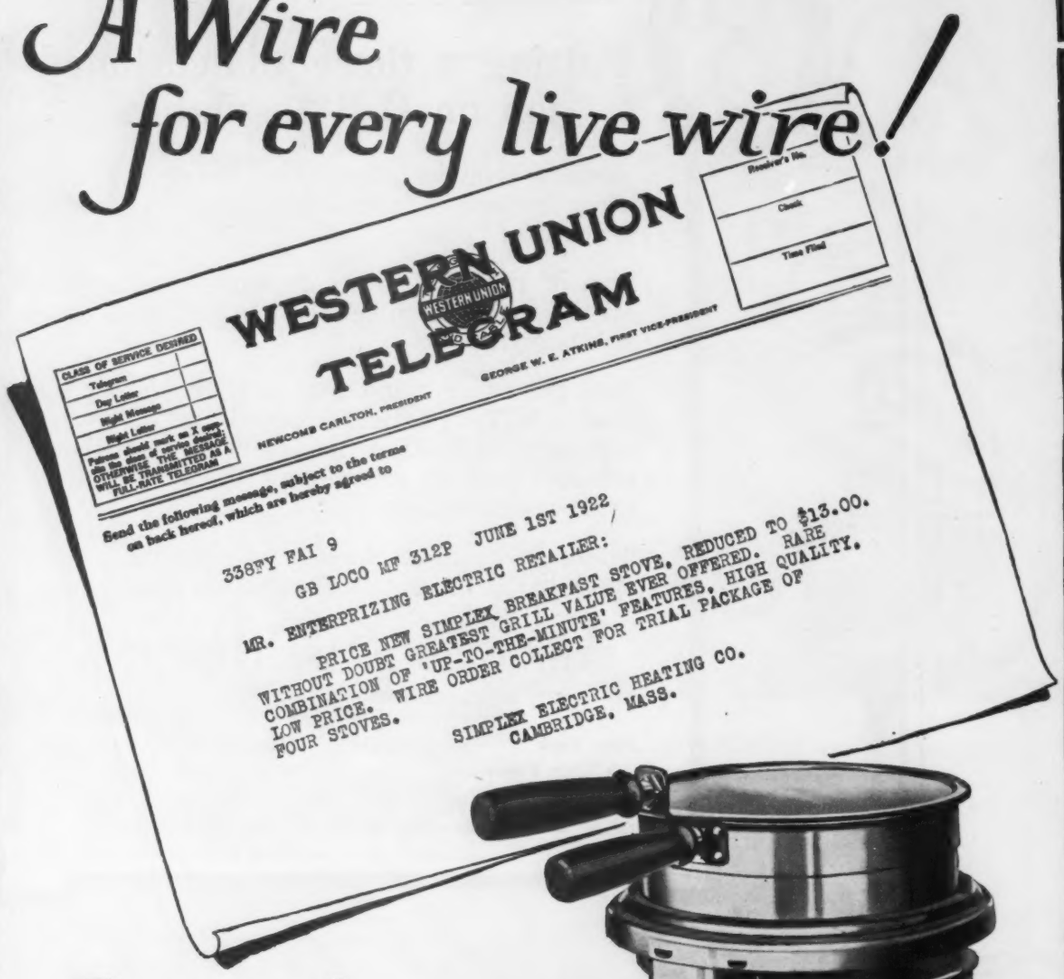
**Mansfield, Ohio**

**New York Philadelphia Pittsburgh Chicago**
**San Francisco Los Angeles Paris, France**

**Manufacturer—High Tension Insulators, Rail Bonds, Trolley Materials, Electric Railway Car Equipment, Third Rail Insulators**



# A Wire for every live-wire!


WESTERN UNION
TELEGRAM
NEWCOMB CARLTON, PRESIDENT
GEORGE W. E. ATKINS, FIRST VICE-PRESIDENT
CLASS OF SERVICE DESIRED
Telegram
Day Letter
Night Message
Night Letter
Send the following message, subject to the terms on back hereof, which are hereby agreed to
338FY FAI 9
GB LOCO MF 312P JUNE 1ST 1922
MR. ENTERPRIZING ELECTRIC RETAILER:
PRICE NEW SIMPLEX BREAKFAST STOVE, REDUCED TO $13.00.
WITHOUT DOUBT GREATEST GRILL VALUE EVER OFFERED. RARE
COMBINATION OF 'UP-TO-THE-MINUTE' FEATURES, HIGH QUALITY,
LOW PRICE. WIRE ORDER COLLECT FOR TRIAL PACKAGE OF
FOUR STOVES.
SIMPLEX ELECTRIC HEATING CO.
CAMBRIDGE, MASS.

## Simplex ELECTRIC GRILL

YOU can't confuse this Great Grill with ordinary table stoves. It is built to be in a class by itself—and it is. Has the exclusive Simplex brass-stock nickel plated construction, aluminum utensils, three heat tumbler switch that makes a hit with every user and other features your customers want. Stock up at once on this sure-selling hot weather appliance. Write for discounts and our real Sales and Advertising Helps—furnished free.

**SIMPLEX ELECTRIC HEATING CO.**
**85 Sidney Street, Cambridge, Mass.**

*Branch Offices*

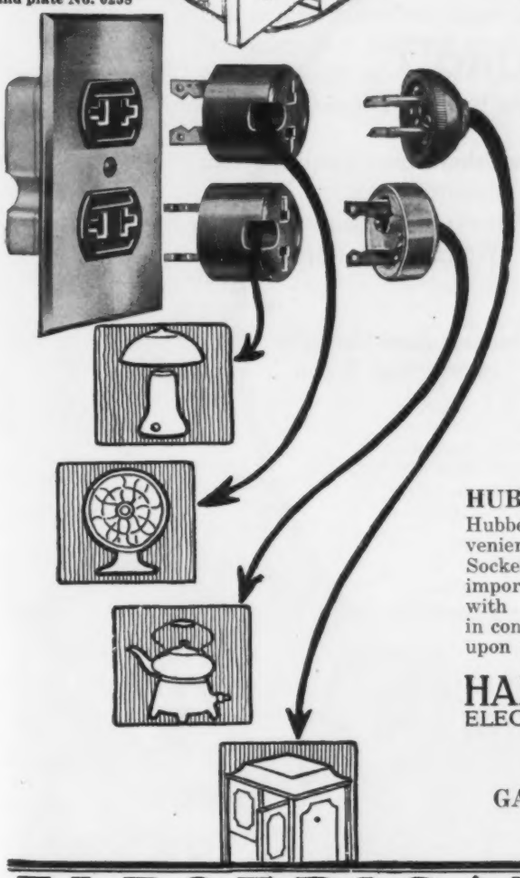
**120 West 32nd Street, New York City**
**15 South Desplaines Street, Chicago, Ill.**

## Now~ $13.00

*We have a new set of Breakfast Stove Window Displays for you that have beauty and a real sales appeal. Get one of these sets in your window — quick. An initial order of four or more stoves brings this display to you.*

# HUBBELL

Duplex
Convenience Outlet
No. 6257
and plate No. 6258



## Convenience Outlets *plus* Hubbell Te-Caps meet all modern needs

STANDARD plug caps, with parallel or tandem blades fit Hubbell Convenience Outlets.

In the picture shown above, a Lamp, Fan, Table Stove, and Phonograph are plugged into a Hubbell Duplex Convenience Outlet No. 6257. The **Lamp** and **Fan** are equipped with Hubbell Te-Caps, each of which provides a Te-Slot outlet taking the ordinary plug caps used with the **Table Stove** and Phonograph.

Hubbell Convenience Outlets **plus** Hubbell Te-Caps meet all modern electrical needs.

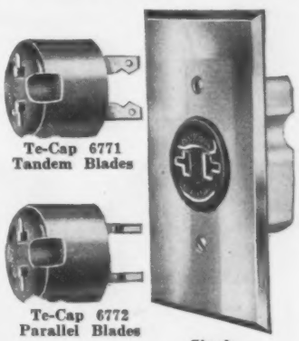
**HUBBELL Completeness**

Hubbell Devices cover the field. Convenience Outlets, Toggle Switches, Sockets, Plugs and Caps, and many important specialties, provide you with a reliable line, fully described in convincing circular matter sent free upon request.

HARVEY HUBBELL INC
ELECTRICAL SPECIALTIES
BRIDGEPORT CONN. U.S.A.

2253-U

Pacific Coast Representative
GARNETT-YOUNG & CO.,
612 Howard Street
San Francisco, Cal.



Te-Cap 6771
Tandem Blades

Te-Cap 6772
Parallel Blades

Single
Convenience Outlet
No. 5547
and plate No. 5548

ELECTRICAL SPECIALTIES

# Two Things to Remember in Fighting Corrosion

THE successful protection of metal surfaces against corrosion is largely dependent upon two factors: the application of a protective paint or enamel which is especially formulated to combat the particular type of corrosion in question and care in the preliminary preparation of the surface to be coated.

It is costly practice to use cheap paint or other protective coatings without knowing whether they are suited to the conditions, in fact, many cheap paints contain pigments which actually stimulate corrosion. The safe and economical procedure is to take advantage of the advice and services of corrosion specialists and to use the protective coating made and specified for each particular purpose.

Even though the coating is suitable, if it is applied to wet, greasy or rusty surfaces, the protective film is sure to crack in some places and adhere in others, making countless tiny pockets for the collection of moisture. Each pocket is a complete galvanic battery in itself, which causes immediate pitting—the most malignant form of corrosion.

Extensive experience in meeting corrosion problems has qualified the Hill-Hubbell organization to serve you in an advisory capacity. You are under no obligation if you call us in to examine your equipment and help you determine the type of protective material and application which would best meet your conditions.

*Write for our specification bulletins—"Bituminous Anti-Corrosive and Water-Proof Coatings for Iron, Steel, Concrete and Wood."*

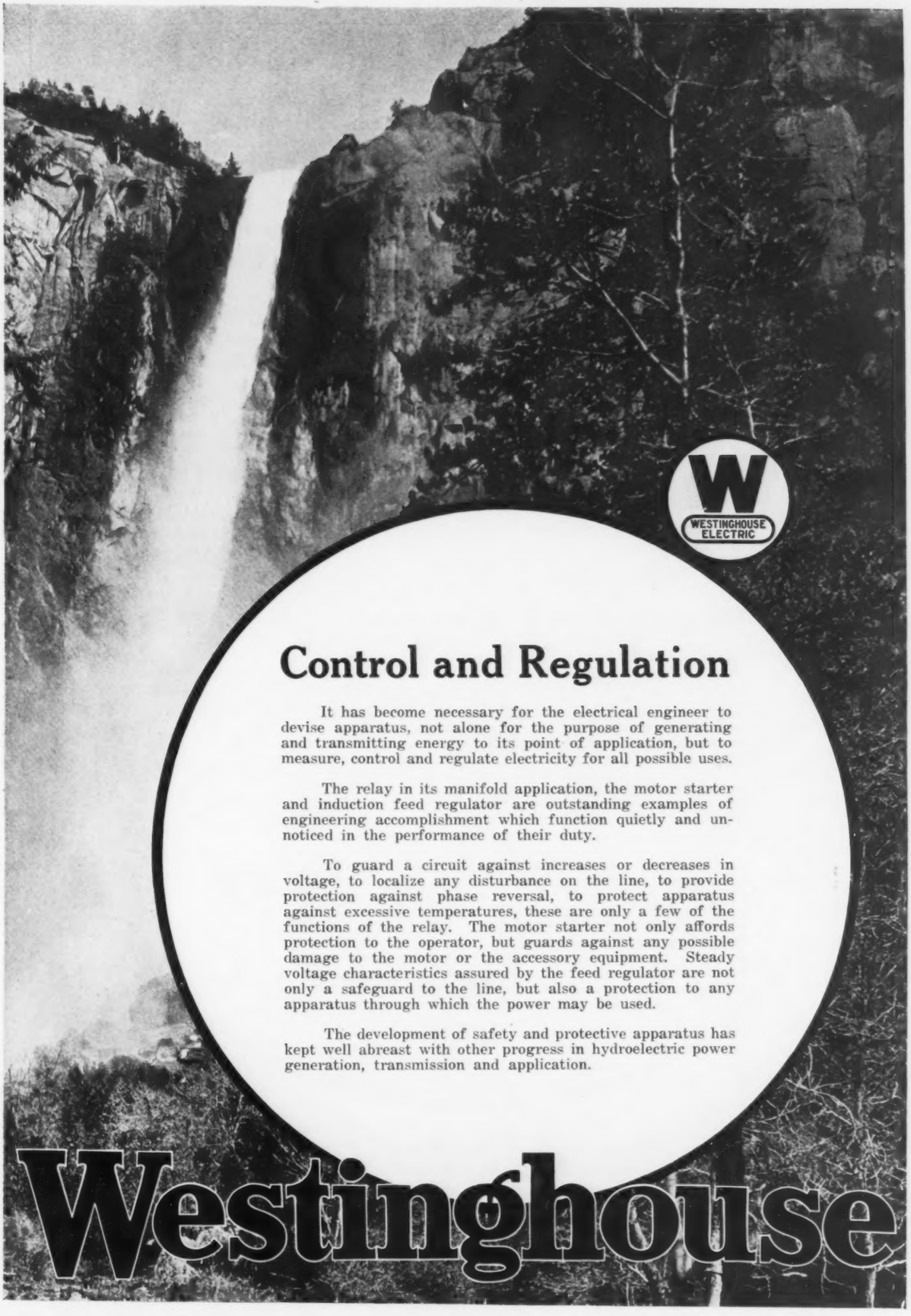
PRODUCTS

*Biturine Solution and Enamel*
*Biturine Roof Coating*
*Biturine Fyberkote*
*Biturine Boiler Wall Insulator*

HILL HUBBELL & COMPANY
115 Davis St. San Francisco
1612 Compton Avenue Los Angeles
816 Western Avenue Seattle
TRADE MARK REG.

PRODUCTS

*Biturine Plastic Cement*
*Vulcanite Mastic Flooring*
*Lighthouse Marine Paints*
*Lighthouse Industrial Paints*


W
WESTINGHOUSE ELECTRIC
Control and Regulation
It has become necessary for the electrical engineer to devise apparatus, not alone for the purpose of generating and transmitting energy to its point of application, but to measure, control and regulate electricity for all possible uses.
The relay in its manifold application, the motor starter and induction feed regulator are outstanding examples of engineering accomplishment which function quietly and unnoticed in the performance of their duty.
To guard a circuit against increases or decreases in voltage, to localize any disturbance on the line, to provide protection against phase reversal, to protect apparatus against excessive temperatures, these are only a few of the functions of the relay. The motor starter not only affords protection to the operator, but guards against any possible damage to the motor or the accessory equipment. Steady voltage characteristics assured by the feed regulator are not only a safeguard to the line, but also a protection to any apparatus through which the power may be used.
The development of safety and protective apparatus has kept well abreast with other progress in hydroelectric power generation, transmission and application.
Westinghouse

# Westinghouse Type WK-100
## Safety Motor Starters
### Single Throw — Quick Make — Quick Break

Type WK-100 Starter with handle locked in OFF position

Type WK-100 Starter with door open, showing access to protective devices. All live parts are dead

These Motor Starters have automatic overload and low voltage trip for alternating current motors up to 3 hp.—110 volts; 10 hp.—250 volts and 15 hp.—550 volts, single-phase, two-phase and three-phase.

They possess an unusual number of protective features, prominent among which are:

1. Perfect safety to the operator.
2. Full protection to the motor in starting.
3. Under-voltage release.
4. Inverse Time-Element overload release.
5. Switch will not remain closed on under-voltage or overload.
6. Switch is opened or closed by hand by moving the operating handle to the "Off" or "On" position.
7. Switch can be locked in the "Off" position.
8. Door is interlocked with switch mechanism so that it can be opened only when the switch is in the "Off" position.
9. When the door is open all accessible parts are dead and the switch is locked "Off."
10. Entire switch mechanism can be removed and replaced without disturbing the box or conduits.
11. Operating mechanism, and under-voltage coil, are easily removed from the front without disturbing other switch parts.
12. Switches are double break, dividing the arc between two points.
13. Knockouts are provided in the top, bottom and sides of the box.
14. Overlapping cover makes box dust-proof.
15. Line terminals and motor terminals are plainly indicated on the slate base.
16. Switch has approval of Board of Fire Underwriters.

**Send for Catalogue 12-A**
**It gives full particulars**

W WESTINGHOUSE ELECTRIC

**Westinghouse Electric & Manufacturing Co.**
**Krantz Works, 160 Seventh St., Brooklyn, N. Y.**

# Westinghouse

# Westinghouse Relays

## A Complete Line

W
WESTINGHOUSE ELECTRIC
Type CT Temperature Relay
Type CO Overload Relay
Type CP Reverse-Phase Relay
Type CV Voltage Relay
Type CW Power Relay for A.C. Circuits
Type CR Reverse Power Relay
Type M Multiple-Contact Auxiliary D.C. Relay
Type R Service Restoring Relay
Type KN Signal and Trip Free Relay
Type TO Overload Relay D.C.
Type D Reverse-current Overload and Temperature Relay, D.C.
Type CB Overload Relay
Cycle counter for measuring time of operation of relays

Westinghouse Relays are the most accurate and reliable means known for obtaining the following results:

Protection of electric-power equipment from short circuits and grounds.

Prevention of interruptions in service and costly shutdowns due to line troubles.

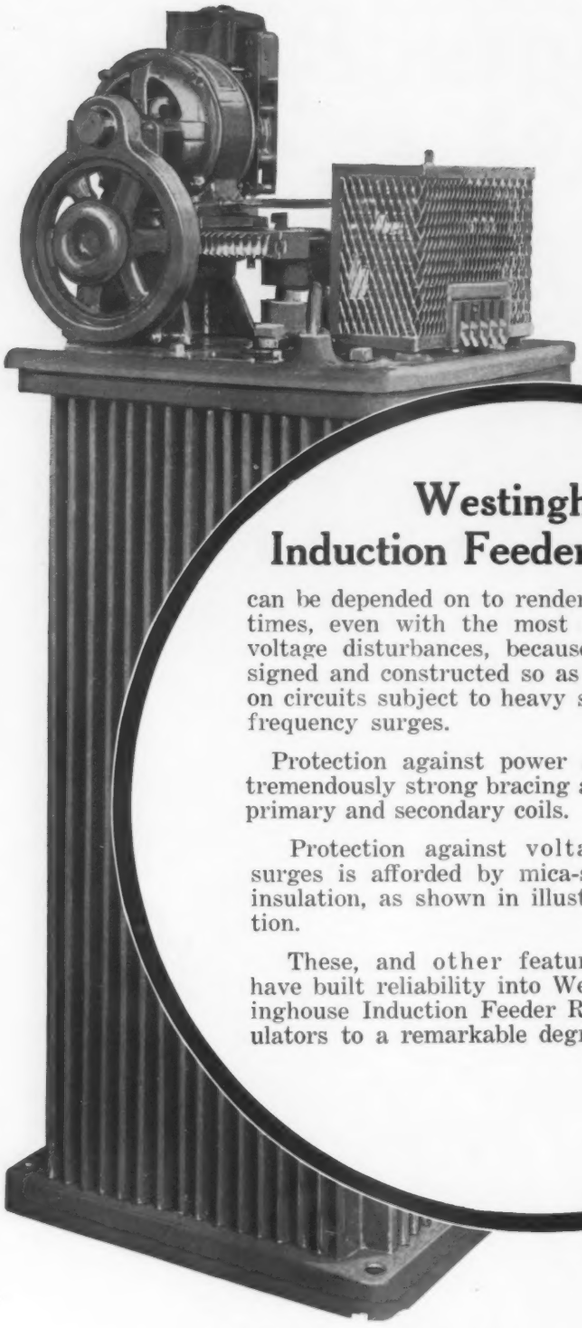
Efficient loading of transmission line and distribution feeders.

To obtain these results the expense of installing Westinghouse Relays on your system is fully justified.

This complete line of Westinghouse Relays is described in detail in the Westinghouse Catalogue of Electrical Supplies on pages 643 to 660 inclusive.

**Westinghouse Electric & Manufacturing Co.**
**Newark Works, Newark, N. J.**

# Westinghouse



# Safety and Service

W WESTINGHOUSE ELECTRIC

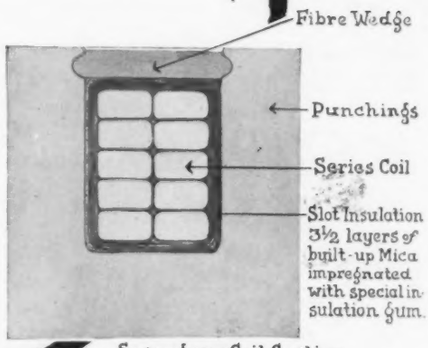
## Westinghouse Induction Feeder Regulators

can be depended on to render reliable service at all times, even with the most severe power or line-voltage disturbances, because they have been designed and constructed so as to be suitable for use on circuits subject to heavy short circuits and high frequency surges.

Protection against power surges is afforded by tremendously strong bracing at the ends of both the primary and secondary coils.

Protection against voltage surges is afforded by mica-slot insulation, as shown in illustration.

These, and other features, have built reliability into Westinghouse Induction Feeder Regulators to a remarkable degree.




Secondary Coil Section, including portion of Punchings.

Descriptive Leaflets Nos. 3916, 3919 and 3927 contain further interesting particulars; copies mailed on request.

**Westinghouse Electric & Manufacturing Company**

East Pittsburgh, Pa.

San Francisco, 1 Montgomery St.
Seattle, Second and Cherry Sts.

Portland, Broadway and Morrison Sts.
Salt Lake City, 2nd South and Main Sts.

Denver, 910 Fifteenth St.
Los Angeles, 7th and Spring Sts.

# Westinghouse

## Another New One in the

# Magee Electric Family

**Indications go to prove this will be a remarkable seller.**

## MAGEE ElectriGas

**A 1-2 Electric and 1-2 Gas Cabinet Range a Little Over Four Feet Long That Offers Extraordinary Cooking Conveniences. An Ideal Combination, Economical and Effective.**

**Furnished in Ebony Black or Gray Porcela Finish**

### The Magee ElectriGas Uses the Two Fuels, Electricity and Artificial or Natural Gas, in a Manner in Which Each of These Fuels Excel

The ELECTRIC half includes:

An Electric Oven or Insulated Fireless Cooker, 18x18x14, an Electric Broiler, and an Outlet Receptacle for Washing Machine, Flat-Iron, etc. These are Operated in Front From Our Cool (Pat.) Switch-Board. The Equipment is "Edison" Standard Throughout the Country.

The GAS half includes:

Five Gas Burners, Which Are Lighted Automatically—**Just Press the Button.** For Boiling and All Cooking in Pots and Pans, Gas is a Most Desirable Fuel as it is Instantaneous. The Gas Table as well as the Oven can be used in Either Right or Left Hand Position.

**The Most Remarkable Range Since the Introduction of the Magee ElectriCoal**

**Write us for full information and territory rights.**

## MAGEE FURNACE COMPANY

**38 Union Street, Boston, Mass.**

# Souvenir Lamps?

**Every Electric Lamp removed from the sockets in your buildings is taken at your request.**

You do not even suggest to the souvenir-hound that they are your lamps.

That isn't the worst of it—

If you can take a lamp from the corridors, wash rooms or stairways—so can the lamp collector.

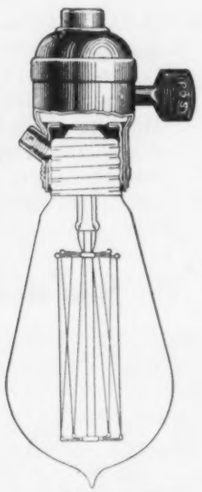
Shurlok Sockets lock the lamps with a master key. You control the key and like your vault key, it protects your property.

No mystery about it. Men are naturally honest and have an instinctive respect for another's property.

A few Shurlok Sockets—where the lamps are in easy reach will do the trick.

Shurlok Sockets arouse the instinct of honesty and prevent the taking of lamps from your buildings—at your request.

**If you've never seen a Shurlok Socket — write us today.**



— a "Close-up"
*The Socket that Locks*

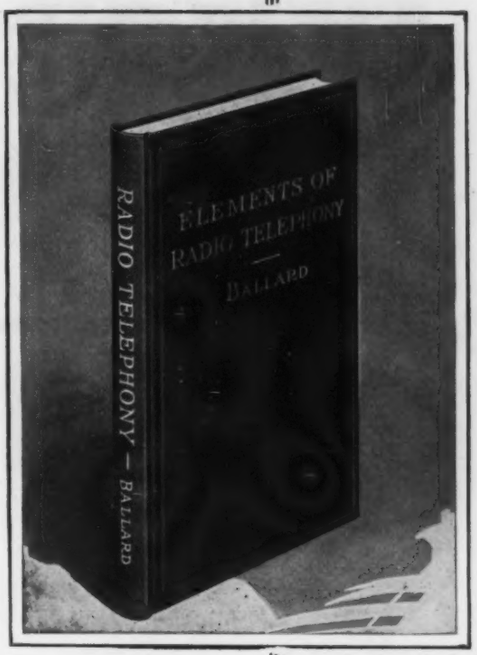
*The Shurlok Key*

**PASS & SEYMOUR, INC.**
SOLVAY, N. Y.

STANDARD ELECTRIC
P&S
WIRING DEVICES

NEW YORK BOSTON CHICAGO
PHILADELPHIA SAN FRANCISCO

# *Just Out!*




## Elements of
# RADIO TELEPHONY

By W. C. BALLARD, JR.
Assistant Professor of Electrical Engineering,
Cornell University

**130 pages, pocket size, flexible, fully illustrated,
$1.50 net, postpaid**

Here is the book on radio telephony you have been looking for—accurate, scientific, the work of a recognized authority, yet simple and clear, telling you just the things you need to know about radio telephony, and with no involved mathematics.

The book has a three-fold purpose:—

1. It presents a brief, simplified discussion of what happens when messages are sent and received by radio;
2. It gives a clear description of the apparatus required to produce these effects and explains how this apparatus operates;
3. It furnishes practical, unbiased information for the experimenter who desires certain results but who does not know what apparatus is necessary.

**Folks have been asking us: "When will the McGraw-Hill book on radio telephony be ready?"**

Here it is—accurate, reliable, the work of a recognized authority.

There really has been very little of an authoritative nature up to this time on radio telephony.

There have been some "how-to" books for boys and some other semi-technical material for laymen.

But as publishers of the leading books on radio engineering and vacuum tubes, we wanted a book on radio telephony that would be authoritative as well as simple. And we have it, we believe, in Professor Ballard's book.

The man with a technical background who wants to read up on radio will find this new book just the book for his purpose.

Because of Professor Ballard's intimate contact with amateur radio operators' problems, the book will be of special value also to amateurs.

**EXAMINE THIS NEW BOOK FOR 10 DAYS FREE**

**It tells you the things you want to know about radio telephony**

***Free Examination Coupon***

**McGraw-Hill Book Company, Inc., 370 Seventh Avenue, New York.**

You may send me on 10 days' approval—BALLARD'S RADIO TELEPHONY ($1.50 net postpaid).

I agree to pay for the book or return it postpaid within 10 days of receipt.

Subscs. Journal of Electricity?.....

Signed .....
(Please print)

Address .....

Official Position .....

Name of Company.....

(Books sent on approval to retail purchasers in U. S. and Canada only) O-7-1-22

# THE AUSTIN LINE ANSWERS EVERY REQUIREMENT

## The New Female Fixture Stud

Cat. No. 820

Cat. No. 821

Austin Hickey Female Fixture Studs were designed to meet the new requirements made possible by the Underwriter's ruling eliminating the necessity of insulating joints for fixture work.

With these new studs you do away with insulating joints and couplings, the fixture pipe is screwed directly into the stud, therefore, saving on insulating joints, couplings, time and labor.

Characteristic of all Austin studs, —threads are cut deep and clean, are thoroughly galvanized and put up in neat cartons, making a desirable line to handle.

## AUSTIN Fixture Studs

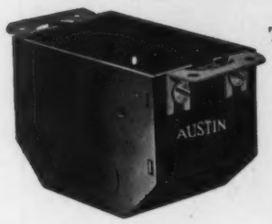
Cat. No. 810

Other Austin fixture studs are the Hickey and Solid types. The Hickey type No. 800 has extra long slots in all four prongs allowing for adjustment... With this stud no Hickeys are required on straight electric work. The Solid type No. 810 is designed to be used either on the inside or outside of box with the shank passing through center hole. The weight of the fixture is then supported by the entire box and not by small screws or bolts as is the case with other types of studs.

Cat. No. 800

## The New Series Switchboxes

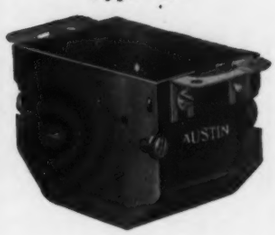
Type "LS-1"




The new series of Austin switchboxes are the last word in labor and money saving devices.

There is an Austin switchbox to meet every demand of the contractor whether for Loom, Armored Cable or Conduit. Austin switchboxes are also made in the sectional and solid gang type. ..Each box is packed in an individual carton with full description on all four sides. Order the switchbox in the Blue Box.

Type "L"




## AUSTIN Box Connectors

Cat. No. 2053

There is an Austin box connector for every kind of work conceivable. Shown here are the familiar squeeze and wedge type connectors. The threads are cut deep and clean and thoroughly galvanized. For convenience in handling these connectors are packed in cartons of 100 with complete description on both ends. A neat and clean stock to handle.

Cat. No. 3053

J. G. POMEROY
336 Azusa Street
Los Angeles, Calif.

**The M. B. Austin Company**
108-116 So. Desplaines St. Chicago

GEO. A. GRAY COMPANY
589 Mission Street
San Francisco, Calif.

# STARTING SWITCH TYPE Z B

Z B Starting Switches installed in a large automobile part plant. Note the location of the Push Button. All Motors are squirrel cage and less than 5 horse power.

**Lost phase protection.**
**No-voltage protection.**
**Overload protection.**

THE ELECTRIC CONTROLLER & MFG. CO.
CLEVELAND, OHIO

FOR SOUTHERN CALIFORNIA:
O. E. THOMAS,
AMERICAN BANK BLDG, LOS ANGELES

FOR STATES OF OREGON AND WASHINGTON:
W. MONTELIUS PRICE, SEATTLE, WASH.

FOR NORTHERN CALIFORNIA:
C. F. HENDERSON,
CALL BLDG., SAN FRANCISCO

AN occasional cleaning and oiling is about all of the attention required by the motors in plants which are R & M equipped. Their liberally proportioned, dust-proof, accurately fitted bearings, sturdy frames and low temperature ratings keep them on the job year after year, in times of forced production and heavy overloads as well as under normal operating conditions.

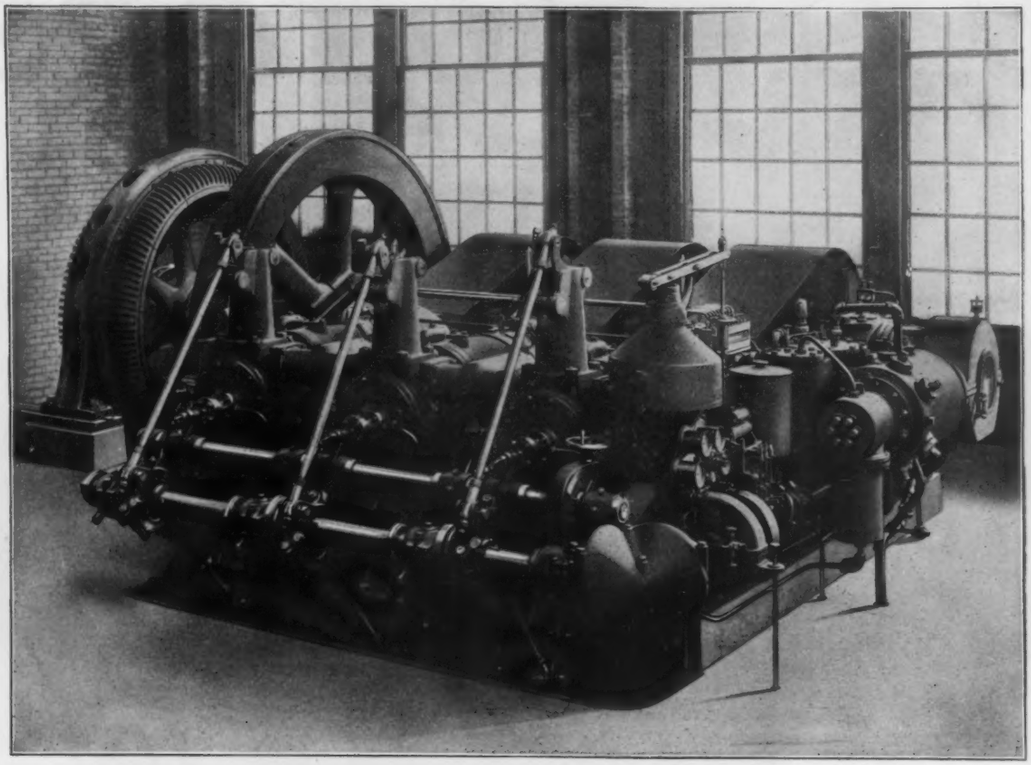
Whatever the emergency may be, the factory engineer and plant electrician know their R & M motors will meet the demand. That is why those who have had experience with these motors speak for R & M when new motors are needed.

Distributors and dealers find this attitude of the factory men a big help when selling R & M motors to industrial users. Power companies too, find the enthusiasm of such customers a help when converting other power users to electric drive.

THE ROBBINS & MYERS COMPANY
Springfield, Ohio Brantford, Ontario

*Pacific Coast Office, 701-702 Rialto Bldg., San Francisco*

Robbins & Myers Motors



Allis-Chalmers Triplex Oil Engine and Generator Unit

# Diesel Engine Drive

The high thermal efficiency of the Allis-Chalmers Diesel Engine and its special constructive features, together with the fact that it can be successfully used with any fuel oil that can be pumped, make it a particularly economical and desirable form of prime mover.

Complete electric power units Diesel engine driven and engines for either direct connected or belted service are designed and built by the Allis-Chalmers organization.

***Send for Bulletin 1532-A***

# ALLIS-CHALMERS
## MANUFACTURING COMPANY

*ELECTRICAL MACHINERY*
*STEAM TURBINES — STEAM ENGINES*
*HYDRAULIC TURBINES*
*GAS ENGINES — OIL ENGINES*
*MINING MACHINERY*
*CRUSHING AND CEMENT MACHINERY*
*FLOUR AND SAW MILL MACHINERY*

*PUMPING ENGINES*
*CENTRIFUGAL PUMPS*
*CONDENSERS*
*AIR COMPRESSORS — AIR BRAKES*
*STEAM AND ELECTRIC HOISTS*
*AGRICULTURAL MACHINERY*
*POWER TRANSMISSION MACHINERY*

## MILWAUKEE, WISCONSIN. U.S.A.

*District Offices in All Principal Cities*

# U. S. MOTORS

## Motor Value Without Precedent

With effortless ease U. S. Motors deliver their full volume of power with strong, silken, uninterrupted flow. The sound design and scrupulous manufacturing principles reflected in these motors are a source of satisfying assurance to one who is seeking the best in motor construction. Without disparaging other good motors we conscientiously believe you cannot find another type of motor that can duplicate U. S. Motor performance.

**U. S. ELECTRICAL MFG. CO.**

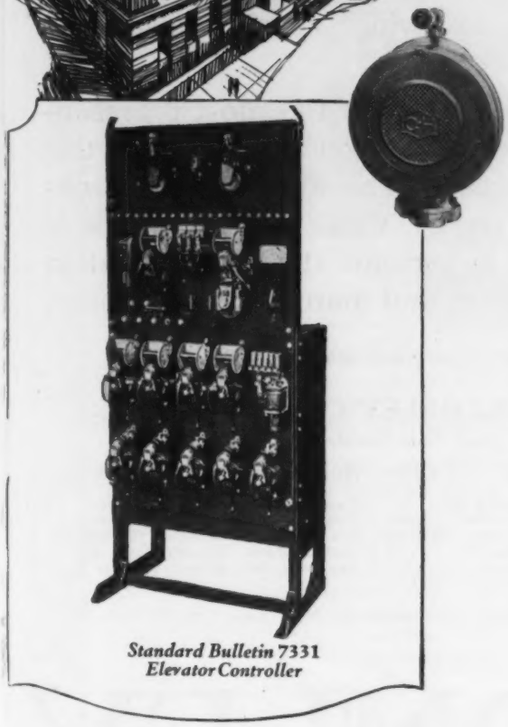
Largest motor builders in the west since 1906

Our electrical engineers are at your service

Branch office and warehouse at Stockton

LOS ANGELES

*Cutler-Hammer Controller used in connection with Haughton Elevators, National City Building, New York*



*Standard Bulletin 7331 Elevator Controller*

# What's Back of the Present Day Electric Elevator?

SPEED of travel and safety must be insured the six million people who depend upon the 10 elevators in the National City Building, New York. Along with the right kind of elevator machine, and the right motors, the selection of control is essential to provide the service demanded today.

With elevators traveling at speeds of 600 feet per minute, dependable acceleration of the motors is necessary; protection to the motors; automatic insurance against over-travel; smooth slow-down; accurate stopping.

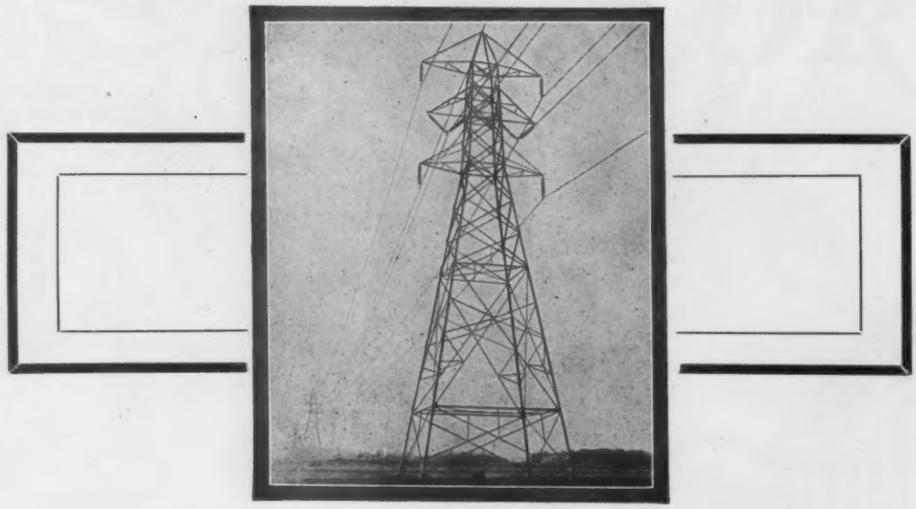
Instant response to the master car switch in the operator's hands; service and safety to passengers are provided through this control.

Publication 2045 gives much valuable information on elevators. A copy will be mailed on request.

THE CUTLER-HAMMER MFG. CO.
*Motor Control Department*
*Works:* MILWAUKEE *and* NEW YORK

*Pacific Coast Agents:*
*H. B. Squires Company*
*Los Angeles* *San Francisco* *Seattle*

C-H ELEVATOR CONTROLLERS



# Proven By Performance

**Designers**
**Manufacturers**
**Erectors**

Blast Furnace Plants
Steel Storage Tanks
Standpipes
Riveted Steel Pipe
Stacks
Oil Refineries
Gas Plants and Gas Holders
Ladles
Galvanizing Kettles
Digesters
Steel Barges
Steel Transmission Towers
Steel Plate Work
of every description

RITER-CONLEY

SINCE 1905 our organization has constructed over 22,000 steel towers of various kinds, involving more than 46,000 tons of steelwork.

We have served many of the most representative light and power concerns both in this country and abroad. The oft repeated patronage accorded us by those whom we have already served is perhaps the best indication of our engineering and manufacturing ability.

Send us your inquiry and ask for booklet A-329

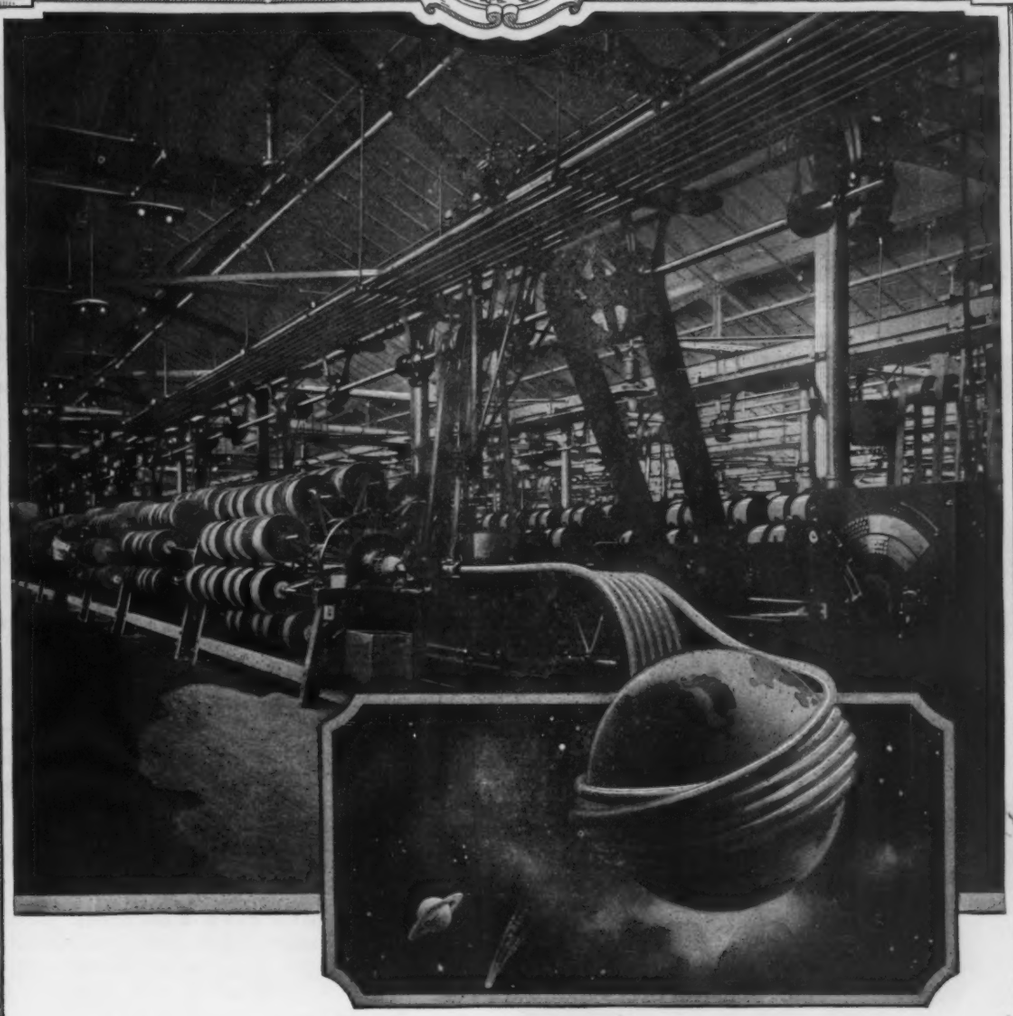
**RITER-CONLEY COMPANY**
**Steel Plate Construction**

*General Offices:* 318 Oliver Building, Pittsburgh, Pa.

Boston, Mass., 68 Devonshire Street
Chicago, Ill., 1st National Bank Building
Cincinnati, Ohio, Union Central Building
Cleveland, Ohio, Hanna Building
Dallas, Tex., Scollard Building
Detroit, Mich., Book Building
New York City, 50 Church Street
Philadelphia, Pa., Morris Building
San Francisco, Cal., Call Building
Seattle, Wash., Colman Building
Baltimore, Md., Munsey Building

*Foreign Contract Dept.:* 50 Church St., New York City, U. S. A.

# RITER-CONLEY
## Steel Transmission Towers



## Spinning telephone cable, with the world for a spool

Cable enough to go 'round and 'round the earth has been turned out by machines like this, at the Western Electric telephone plant in Chicago.

In a year the output is over 6,000 miles —and since the average cable is made up of 406 separate wires, this means 2,436,000 miles of copper wire.

The demands of your telephone service are great and growing. Each year you need more cable, more telephones, more switchboards—and not only more equipment but better equipment.

All this has brought an ever greater manufacturing problem, which the Western Electric Company is fully able to meet. It has drawn on an accumulating experience now matured by forty-five years of constantly heightened skill and self-imposed standards of practice.

Western Electric

Since 1869 Makers of Electrical Equipment

# *The* THOMAS QUALITY

## *FIVE-TEN* SERIES

Here and there on any line you will find a place for the ***THOMAS*** Five-Ten Series. It may be a "dead-end" point on the system or it may be an important "guy" line. But the requirement is there nevertheless and should be cared for now, rather than after the "breakdown"

We submit this new series of Wet Process Strain Insulators for your consideration, with the suggestion that you note particularly the unparalleled strength of each type.

The dielectric strength found in the ***Five-Ten*** series is consistent with the high standard established by other Thomas Quality Insulators in the past. The mechanical test data as shown in the following table assures "safety" construction when you use any one of these dependable types.

ULTIMATE MECHANICAL STRENGTH

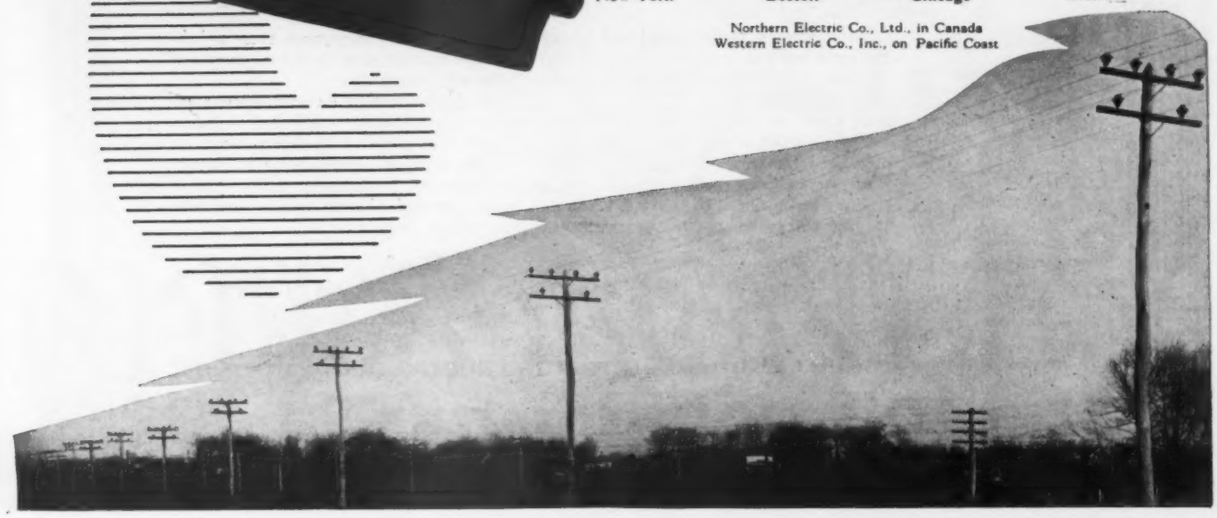
| | |
|---|---|
| Catalogue No. 510 | 10,000 lbs. |
| Catalogue No. 511 | 15,000 lbs. |
| Catalogue No. 512 | 20,000 lbs. |

Write today for full information. Ask for Blue Sheet of the ***FIVE-TEN*** Series.

THE R. THOMAS & SONS CO.
EAST LIVERPOOL, OHIO, U. S. A.

New York Boston Chicago London

Northern Electric Co., Ltd., in Canada
Western Electric Co., Inc., on Pacific Coast



# DUNCAN

## *A.C. Watthour Meters*

Buying a meter is like buying a watch. The man who needs a watch, if he's wise buys a good one and thereafter expects it to run without more than once-a-year cleaning.

Simplicity, skillful design, and careful manufacture have made the present-day watch a graceful and utilitarian combination familiar to us all. Meters, the same way.

The thing to think about here, of course, is the wisdom of securing **good** meters in the first place, in order to secure service unhampered by excessive maintenance, costly repairs or more costly inaccuracies.

Duncan Watthour Meters are good meters. Ask our representatives to prove it.

**Pacific Coast Agents**

**COAST EQUIPMENT CO.**
San Francisco Los Angeles Portland Seattle

**NORTH COAST ELECTRIC CO.**
Seattle Portland Tacoma Spokane

**Duncan Electric Mfg. Co.**
**Lafayette, Ind.**

## They Will Never Stick if They're 'Union' Renewable Fuses

When you buy a "Union" Renewable Fuse you get a fuse that is Renewable in reality as well as in name. A new link can be inserted in jig time without fuss or trouble. **And the fuse is good for an indefinite number of renewals!**

There is no inner cartridge to swell from moisture or as a result of pressure from gases in a short circuit blow. There are no metal parts that can become fused together from heat. Nothing to stick or cause trouble.

"Union" Renewable Fuses are constructed as a fuse ought to be constructed—substantially.

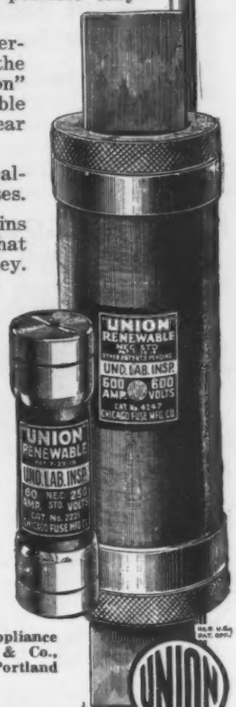
They have strength enough to stand up against the punishment of repeated blowouts, and the few strong, simple parts make possible easy and quick renewals.

The National Board of Fire Underwriters have approved, in the very highest degree, both "Union" Renewable and Non-Renewable Fuses. Fuses and links both bear their inspection label.

Leading electrical jobbers and dealers everywhere sell "Union" Fuses.

Our new 96-page Catalog contains a lot of valuable information that will save you trouble and money. Let us send you a copy.

**The "Union" Saves More Than Any Other Renewable Fuse.**




**Chicago Fuse Mfg. Co.**

**Manufacturers of Switch and Outlet Boxes, Cut-Outs, Fuse Plugs, Automobile Fuses, Renewable and Non-Renewable Enclosed Fuses.**

CHICAGO NEW YORK

**Illinois Elec. Co., Los Angeles. Elec. Appliance Co., and Dunham Carrigan, Hayden & Co., San Francisco. Fobes Supply Co., Portland and Seattle.**

**UNION**
**RENEWABLE FUSES**
save more than ANY other renewable fuse

# Ready Reference for Western Buyers


**ALEXANDER AND LAVENSON ELECTRICAL SUPPLY CO.**

Bluebird Electric Clothes Washers
Williamson Lighting Fixtures
Manning-Bowman Heating Appliances
Trumbull Safety Switches
Noark Fuses
Bryant Material
Westinghouse Lamps
Insulating Supplies
Duracord
Wheeler Industrial Lighting
Construction Supplies
Johns-Manville Products
Robbins & Myers Products
Estate Electric Ranges

132-138 Second Street,
SAN FRANCISCO, CAL.

**John A. Roebling's Sons Co. of California**

San Francisco Los Angeles
Portland Seattle

Wire Rope
Blocks and Fittings
Electric Wires and Cables
Wire Cloth and Netting
Wire Products

**Listenwalter & Gough, Inc.**

JOBBERS OF
ELECTRICAL SUPPLIES

Distributors for
Royal Electric Cleaners
Estate Range Company
American Electrical Heater Co.
Johns-Manville Products
Trumbull Electric Mfg. Co.
Williamson Lighting Furniture
Radiant Lights

LOS ANGELES CALIFORNIA

**FEDERAL ELECTRIC COMPANY**

Manufacturers — Wholesalers

Electric Signs
Electric Appliances
Electric Supplies
of all descriptions

2713 Elliott Ave., Seattle, Wash.
91 New Montgomery St., San Francisco

BUTTE — MONTANA — GREAT FALLS

**The Montana Electric Co.**

JOBBERS OF
EVERYTHING ELECTRICAL

WESTINGHOUSE
DISTRIBUTORS

Mine, Mill and Factory
Electrical Supplies

NO INQUIRY TOO LARGE

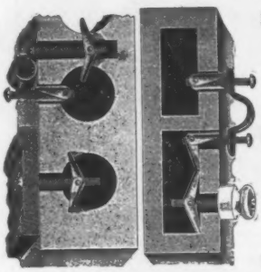
**REIMAN WHOLESALE ELECTRIC COMPANY**

Jobbers and Distributors
— of —
WIRING MATERIALS
APPLIANCES
GLASSWARE and FIXTURES
RADIO SUPPLIES

224-228 East Third St.,
Los Angeles, Calif.

**PAINE TOGGLE BOLTS**

"THE PRACTICAL TOGGLE"



Save Their Cost in Time and Patience

THE PAINE CO.
1742 Van Buren St.
CHICAGO

Work Instantly
In Any Position In Any Hollow Material

**Hiring Men?**

Need reliable help for office, stock, salesroom or shop? After we get through quizzing and investigating, the man we send is the man you want. Try us and see what we can do.

Employment Service

220 Golden Gate Ave. YMCA Telephone Franklin 461

San Francisco
Not an Agency
No fees to either employer or employee

**Wholesale Electric Co.**

817 Mission St. San Francisco
Wholesale Only
A. R. Fierce, Prop.
Agents for
Chelton Electric Company's line
Switches, Receptacles, etc.
Federal Machine & Welder Co.,
Electric Spot and Butt Welders.
Colin B. Kennedy Company
Radio Receiving Apparatus.
Multi Electric Mfg. Company
Pipe Fittings and Porcelain
Outlet Bushings, etc.
Manhattan Electrical Supply Co.,
"Red Seal" Batteries.
Also jobbers of several other
well known lines.

**MYERS ELECTRIC SUPPLY CO.**

Los Angeles

Hocking Illuminating Glassware
Macbeth Evans Monax & Alba Glassware
Arrow Electric Co. Wiring Devices
Cutler-Hammer Mfg. Co. Products
Phoenix Glass Co. Illuminating Glassware
Max Schaeffer Co. Illuminating Glassware
Lincoln Lighting Fixtures and Brackets
Detroit-Safety and N. I. R. Wire
Colonial Lighting Fixtures and Brackets
Safety Electric Switches and Cabinets
Appleton Electric Products
Killark Electric Products

1727-1731 S. Los Angeles Street

**Buyers**

can well afford to patronize those registered on these pages as it is evidence of mutual co-operation in the upbuilding of the West.

**THEO F. DREDGE**

POWER PLANT EQUIPMENT

RICHARDSON-PHENIX
OIL FILTERS AND OILING SYSTEMS
PITTSBURGH
PIPING INSTALLATIONS, BENDS
ECONOMY
PUMPS AND SEWAGE EJECTORS
COFFIN
SLUICE GATES, VALVES, HYDRANTS
McALEAR
PRESSURE REGULATORS, VALVES
TYLER
EXPANSION JOINTS, CONDUIT, METERS
FALLS
ENGINE AND TURBINE STOPS

817-19 MONADNOCK BUILDING
SAN FRANCISCO

# Ready Reference for Western Buyers


## Electric Appliance Co.

SAN FRANCISCO

JOBBERS OF ELECTRICAL AND AUTOMOBILE SUPPLIES

DISTRIBUTORS FOR

Packard Lamps
Parac Rubber Covered Wire
"O. K." Weatherproof Wire
Eden Washing Machines
Bryant and Perkins Material
Union Refillable Fuses
Universal Heating Goods
Universal Washing Machines, Ranges and Vacuum Cleaners
Trumbull Circle "T" Switches
Sheraduct and Economy Conduit
Crouse-Hinds Material
Emerson Motors
Everhot Electric Hot Water Systems

LOS ANGELES PORTLAND SPOKANE
OAKLAND SAN FRANCISCO SEATTLE

## PACIFIC STATES ELECTRIC COMPANY

DISTRIBUTORS FOR

Anaconda Copper Mining Co.
Crouse-Hinds Company
Duplex Lighting Works of G. E. Co.
Edison Electric Appliance Co., Inc.
Edison Mazda Lamps
Electric Vacuum Cleaner Co.
The (Orangeburg) Fibre Conduit Co.
General Electric Wiring Devices
Hemingray Glass Company
Holophane Glass Co., Inc.
Hubbard & Company
Hurley Machine Company
Illinois Wire & Cable Co.
Ivanhoe Regent Works of G. E. Co.
Locke Insulator Corporation
Sprague Electric Works of G. E. Co.
Walker Brothers Co.

## Allied Industries

INCORPORATED

Representing

Manufacturers of Electrical Materials of Proven Worth

Marketing through only legitimate channels

Los Angeles
Seattle
San Francisco

## HARTFORD TIME SWITCHES

Assure automatic service without regulation.

Full stock carried in San Francisco of all models.

Repairs promptly handled.

H. J. MUSGRAVE

49 Geary St. San Francisco

## THE WASHINGTON ELECTRIC SUPPLY CO.

S. 152 Monroe St.
SPOKANE, WASH.

WESTINGHOUSE DISTRIBUTORS

"Anaconda Copper Mng. Co." Bare Copper Wire
"A. & F." Water Heaters
"Eureka" Vacuum Cleaners
"Free-Westinghouse" Sewing Machines
"Thor" — Washers, Ironers and Cleaners
"Universal" Electric Home Needs
"Matthews" Anchors and Lamp Guards

Electrical supplies for every requirement

"SERVICE" our Motto

Los Angeles
Chicago

## Illinois Electric Co.

Distributors of
Peerless Mazda Lamps
Free-Westinghouse Sewing Machines
The ROTAPEX Unitized Electric Washer
Apex Vacuum Cleaners
Union Refillable Fuses
Cutler-Hammer Material
Geo. Cutter Products
Crouse-Hinds "Condulets"
New York Ins. Raven Core Rubber-Covered Wire
Westinghouse Electric Household Appliances

JOBBERS

Electrical Supplies

## ERMSCO

ELECTRIC, RAILWAY & MFGRS. SUPPLY CO.

WHOLESALE ELECTRICAL SUPPLIES

36-40 Second St., SAN FRANCISCO

## LOXON LAMP GUARD

THE KEY TO SAFETY

Manufactured By
McGILL MFG. Co.
Valparaiso, Ind.

Fully protects Incandescent Lamps against Breakage and Theft. Locks on with a key. Pays for itself for every lamp saved.

Pacific Coast Representative
J. G. POMEROY
336 Azusa Street Los Angeles, Cal.

TRADE MARK
## HEMINGRAY
REGISTERED

STANDARD GLASS INSULATORS

HEMINGRAY GLASS CO.

Office: Muncie, Indiana

## FOBES SUPPLY COMPANY

—WHOLESALE—
ELECTRICAL SUPPLIES

Portland,
Seattle,
San Francisco
and
Oakland

## Century

A. C. MOTORS
A. C.—D. C. FANS

are sold, installed and serviced in the West by engineers of long and practical experience.

*They Keep-a-running*

## R. J. DAVIS

DISTRICT SALES AGENT

906 So. Hope St. Los Angeles
171-173 Second St. San Francisco

## WESTERN LIGHT & FIXTURE CO.

DISTRIBUTORS

P&S WIRING DEVICES

Hotpoint IRONS and APPLIANCES

G. I. MAZDA LAMPS
VIRDEN FIXTURES
EVEREADY FLASHLIGHTS
MACBETH-EVANS GLASSWARE

301-303 SOUTH LOS ANGELES ST.
LOS ANGELES, CAL.

# DIRECTORY of ENGINEERS

*The Journal of Electricity's selected list of Engineers equipped to handle Hydro-Electric and Industrial Development now under way in the West*

**M. J. BROOKS**
ELECTRICAL TESTING SPECIALIST
Industrial Surveys, Tests, Investigations
Balboa Bldg. San Francisco
Phone Sutter 6994

**FORD, BACON & DAVIS**
Incorporated
Business Established 1894
115 Broadway, New York
Philadelphia Chicago San Francisco

**SANDERSON & PORTER**
1896 1922
Engineering Construction Operation
Build, Develop, Manage
Utility and Industrial Properties
San Francisco, 14 Montgomery St., New York Chicago

**BYLLESBY**
ENGINEERING & MANAGEMENT CORPORATION
208 S. La Salle Street, Chicago
New York Tacoma

**GEORGE L. HOXIE**
CONSULTING ENGINEER
Rate and Condemnation Cases, Valuations, Reports.
831 San Fernando Building, Los Angeles

**Your Card —**
in the Directory of Engineers offers a type of publicity entirely in accord with the ethics of professional men. Let us submit our rates for this space.

**Engineers—**
or engineering organizations interested in securing recognition as prospective builders of the West should appreciate the value of representation in this directory.

**ARTHUR R. KELLEY**
CONSULTING ENGINEER
Reports and Valuations, Public Utility and Industrial Properties
Nevada Bank Bldg. San Francisco

**THEBO, STARR & ANDERTON, INC.**
ENGINEERS AND CONSTRUCTORS
Specializing in Design and Construction of Power Plants, Hydro-Electric, Irrigation and Industrial Projects
Appraisals, Investigations, Reports, Plans and Specifications
Sharon Bldg., San Francisco Fresno, Cal.

Irving C. Harris Wm. S. Cone
**CONE AND HARRIS**
CONSULTING ENGINEERS
Investigation, Design, Supervision
Electric Power and Irrigation Projects
1216 Hollingsworth Bldg. Los Angeles

**LOUIS F. LEUREY**
INDUSTRIAL APPLICATIONS OF ELECTRICITY
58 Sutter St. San Francisco, Cal.

**WILLIAM S. TURNER**
Consulting Engineer
Investigations, Appraisals, Financial Reports, Designs, Construction, Management, Arbitrations
Lighting and Power Plants, Electric Railways, Hydro Electric Developments, Industrial Plants
Member A. S. C. E. Fellow A. I. E. E.
1006 Spalding Building Portland, Oregon

**GEORGE J. EBERLE**
FINANCIAL INVESTIGATIONS
RATE ANALYSES
APPRAISALS
University of Southern California, Los Angeles

**DWIGHT P. ROBINSON & CO., Inc.**
With which is consolidated
Westinghouse, Church, Kerr & Co., Inc.
Design and Construction of
Steam Power Stations, Hydro-Electric Developments, Industrial Plants
Electric Equipment Building, Los Angeles
New York Chicago Youngstown Dallas

**THE J. G. WHITE ENGINEERING CORPORATION**
Engineers—Constructors
Industrial Plants, Buildings, Steam Power Plants, Water Powers, Gas Plants, Steam and Electric Railroads, Transmission Systems.
43 Exchange Place New York

**ELECTRICAL TESTING LABORATORIES**
Electrical, Photometrical, Chemical and Mechanical Tests. Inspections of Materials and Apparatus at Manufactory.
80th Street and East End Avenue
New York

**The West will grow—**
only in proportion to the progress made in hydroelectric development. Representation in this directory keeps your organization before the industry for consideration in this great development work.

**J. G. WRAY & CO.**
ENGINEERS
J. G. Wray, Fellow A. I. E. E. Cyrus G. Hill
Utilities and Industrial Properties
Appraisals Organization Plans
Rate Surveys Construction Estimates
Financial Investigations Management
1217 First National Bank Bldg., Chicago

**CROCKER-WHEELER MOTORS**
*"Niagara's Rival for Dependable Power"*
Industrial Leaders Endorse Economy of
C-W MOTORS
The continuous and dependable operation of these motors means uninterrupted operation of machinery.
*Phone or write nearest branch for bulletins and prices*
**CROCKER-WHEELER COMPANY**
New York Chicago Pittsburgh Philadelphia
Boston Cleveland Newark Baltimore
Syracuse Birmingham AMPERE, NEW JERSEY New Haven San Francisco

**BARE AND INSULATED WIRES**
WEATHER-PROOF TRADE MARK "O.K." LINE AND HOUSE WIRES
*"OK" Weatherproof Wire*
*"Parac" Rubber Wire*
*Slow Burning Wire*
*Bare Copper Wire*
PHILLIPS WIRE COMPANY
Pawtucket, R. I.

# THINK SEARCHLIGHT FIRST

**ADVERTISING RATES—JOURNAL OF ELECTRICITY AND WESTERN INDUSTRY—SEARCHLIGHT SECTION**

**DISPLAYED ADS**—Space is sold by the advertising inch (30 in. to a page). Price per inch is based on total space used (multiply ad space by number of insertions).

RATE PER INCH

1 to 3 in., $3.50 an in. 11 to 29 in., $3.30 an in.
5 to 10 in., $3.40 an in. 30 to 59 in., $3.20 an in.
Rates for other spaces furnished on request.

UNDISPLAYED ADVERTISEMENTS

**POSITIONS WANTED**, including Salesmen Available and other ads of individual employment wanted, 4 cents a word, minimum 75c per issue, payable in advance.

**POSITIONS VACANT**, and all other classifications, 8c a word, minimum $2 an issue.

**ADD 5 WORDS** for box number address in undisplayed ads, if replies are to any of our offices. No additional charge for forwarding replies.

**DISCOUNT OF 10%** if one payment is made in advance for 4 consecutive insertions of undisplayed advertisements.

**POSITIONS OPEN**—Business Opportunities and other undisplayed ads, 6 cents a word, minimum $1.25 an insertion.

**POSITIONS WANTED**—Evening work wanted, tutoring and other undisplayed ads of individuals looking for employment, 4 cents a word, minimum 75 cents, **payable in advance.**

**PROPOSALS**—Advertisements for bids, 40 cents a line.

**ADD 5 WORDS** for box number in undisplayed ads if replies are to any of our offices. There is no extra charge for forwarding replies.

**DISCOUNT OF 10%** if one payment is made in advance for 4 consecutive insertions of undisplayed ad.

**ADS IN DISPLAY TYPE**—Space is sold by the inch (30 in. to a page), the price depending upon total space used within a year, some space to be used each issue.

**RATE PER INCH** for ads in display space:

1 to 4 in., $3.50 an in. 30 to 59 in., $3.20 an in.
5 to 10 in., $3.40 an in. 60 to 99 in., $3.10 an in.
11 to 29 in., $3.30 an in. 100 in. or more $3.00 an in.

## "SEARCHLIGHT"

**is**

**Opportunity Advertising**

—to help you get what you want.

—to help you sell what you no longer need.

**Take Advantage Of It**

**For Every Business Want**

**"Think SEARCHLIGHT First"**

**WANT TO BUY**—45 miles No. 4, 5 or 6 hard drawn used bare copper wire, spot shipment.

**WANT TO SELL**—3-75 kva. each, single phase, outdoor type transformers, 33,000 volts to 11,000 volts.

Write or wire Morton R. Martin, Oregon, Mo.

**For sale by the Alaska Gastineau Mining Co., R. P. Carmien Supply & Forwarding Agt., Alaska Building, Seattle, Wash.**

### General Electric Transformers

4—2000 K.V.A., Single phase, 60 Cy., Water cooled, 1100/2200 to 480 Volts. Mounted on steel trucks for 36" gauge ..... $6600

3—200 K.V.A., Single phase, 60 Cy., water cooled 22000/19800 to 2500 Volts ..... $2200

3—100 K.V.A., Single phase, 60 Cy., self cooled, type H, 480 to 125/250 Volts.. $1100

1—40 K.V.A., Single phase, 60 Cy., self cooled, type H, 460 to 120/240 Volts.... $ 250

### Rotary Converters

2—300 K.W., G.E. type T.C. form P, 60 Cy., 1200 R.P.M., 500 Amp., 600 V., with

Transformers, 3 phase, 460/417 to 377/194 Volts, starting taps and rheostats, and switch board panels with circuit breakers and instruments complete @ ..... $3200 each

**All in first class condition, F. O. B. Seattle.**

IDLE EQUIPMENT
FILLS UP
VALUABLE SPACE
AND COLLECTS DUST.
USE THE
SEARCHLIGHT SECTION
TO PLACE
THE EQUIPMENT
WHERE IT WILL
COLLECT DOLLARS
AND
INCREASED PRODUCTION.

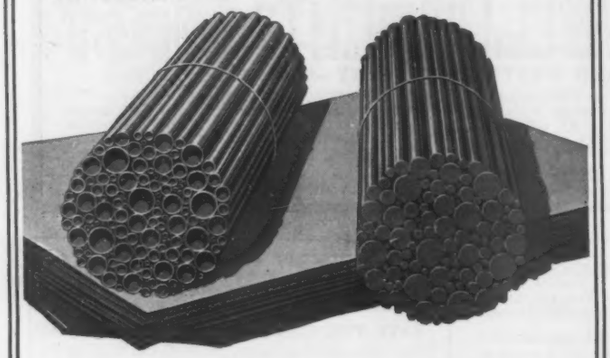
Get your Wants into the Searchlight

## *At Your Service—*

A service wherein the man who is seeking a position or the man who is desirous of obtaining trained men; where information can be found concerning either the purchase or disposal of new and used electrical equipment. The purpose of the *SEARCHLIGHT* section of the *Journal of Electricity and Western Industry* is to render this service. It simply remains for the men in the electrical industry in the West to apply this service to their needs.

**For Every Business Want—Think *Searchlight* First**

*Make it of VUL-COT Fibre*



## In Sheets, Rods and Tubes

Off hand, we know of about thirty separate and distinct places in the electrical manufacturing field where you will find that it is to your advantage to use

## *Vul-Cot Fibre*

—And particularly *Vul-Cot* Fibre because it is always uniform in density and never contains fissures, grit, hard or soft spots.

### *Here's the Reason*

The American Vulcanized Fibre Company, in its mill at Newark, Delaware, inspects, sorts, dusts, and cuts its own rags and makes its own paper. In another part of this big plant, the paper, its thickness gauged to a thousandth of an inch, is made into tough, strong, horn-like *VUL-COT* Fibre. Care and close, constant supervision have been watch-words during the entire process and until it reaches you, in either sheets, rods or tubes, or machined to your specifications.

We have a book—The Material With a Million Uses. Let us send it.

BY INVITATION MEMBER OF

NEW YORK N.S.A.

**AMERICAN VULCANIZED FIBRE CO.**
**509 Equitable Building, Wilmington, Del.**

*SALES OFFICES*

BOSTON NEW YORK PHILADELPHIA PITTSBURGH CLEVELAND DETROIT CHICAGO ST LOUIS

*Complete Stock for Immediate Shipment at Chicago*

Western Agents
*Western Electric Company*
SAN FRANCISCO PORTLAND OAKLAND SEATTLE LOS ANGELES SPOKANE

Canadian Agents
*Northern Electric Company*
LIMITED
MONTREAL OTTAWA REGINA TORONTO HALIFAX VANCOUVER WINNIPEG CALGARY

Physical properties of Vul-Cot Fibre

# Use Maximum Safety Where Safety Counts

AT the California Institute of Technology in Pasadena, Trumbull Safety Switches have been installed because sure, safe, and satisfactory performance is required at all times.

Many of the switches in the installation pictured above are often manipulated by students for whom the Trumbull safety features act as dependable protection against accident or injury.

For installations of every kind and size there are "Circle T" externally operated switches that guarantee safety and satisfaction to **any** operator.

Ask your jobber about the complete line of "Circle T" Switches. Trumbull quality and service, combined with right price, will convince you.

## The Trumbull Elec. Mfg. Co.

**595 Mission St., San Francisco**

**Factory & Gen'l Office**
**Plainville,**
**Connecticut**

**Branches in**
**New York, Chicago,**
**Boston, Philadelphia**

HOW DO YOU TEST YOUR METERS

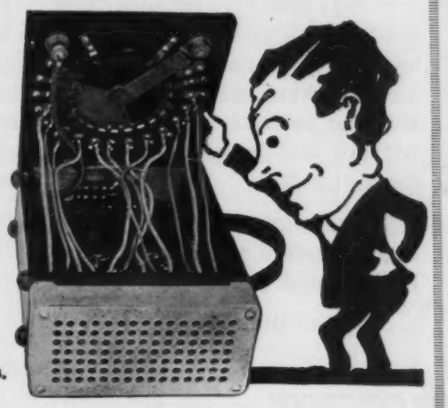
MR. METER SUP'T.
YOU HAD BETTER
LOOK INTO THIS
"TYPE F PORTABLE LOAD"

— NOTE —
Convenience
Simplicity
Workmanship

Three Sizes
15 Amp.
35 Amp.
75 Amp.

20 & 60 Cycles

Weights
5½ to 15 Lbs.



Catalogue No. 1
Section 1

THE STATES CO.

73 Francis Ave.
Hartford, Conn.

TIREX
(ALL RUBBER)
Portable Cord

Tirex Cord is noteworthy because of its clean outer surface. It may easily be wiped clean when soiled and is always ready for the next job. It does not collect and hold dirt or grease and will not absorb moisture.

*Send for descriptive circular*

SIMPLEX WIRE & CABLE Co
MANUFACTURERS
201 DEVONSHIRE ST. BOSTON 9
CHICAGO SAN FRANCISCO



METAL MOLDING

No. 333 Metal Molding

No. 222 Metal Molding

NATIONAL METAL MOLDING—the standard for surface wiring—is stocked by all leading jobbers and used by the best electricians. These jobbers also stock the necessary fittings and devices that are used with National Metal Molding. It is not necessary to have special tools to install NATIONAL METAL MOLDING.

NATIONAL METAL MOLDING "snaps" together, the fittings "snap" to the molding as do the devices. Fishing is eliminated, reducing trouble and labor cost.

Write for our Hand Book.

Name.....

Address.....

City .....

National Metal Molding Co.
Pittsburgh, Pa.

*Introducing*

## Roller-Smith Universal Type Radio Telephone Receivers

"UNIVERSAL" because they give equally good results with crystal or vacuum tube sets and are also **particularly** well adapted for loud speaking units. They are highly sensitive and perfectly matched. They reproduce without distortion from the highest to the deepest notes.

The design and workmanship are of the high standard which is characteristic of all **Roller-Smith** products.

Send for Bulletin No. H-20. It's free.

BALTIMORE, 113 E. Franklin St.
BIRMINGHAM, Brown-Marx Bldg.
BOSTON, 141 Milk St.
BUFFALO, Ellicott Square
CHICAGO, 430 So. Greene St.
CLEVELAND, 7016 Euclid Ave.
DALLAS, 2002 1-2 Live Oak St.
DENVER, U. S. Nat'l Bank Bldg.
LOS ANGELES, Title Insurance Bldg.
MEMPHIS, 493 S. Main St.
MINNEAPOLIS, 414 South 6th St.

**ROLLER-SMITH COMPANY**
Electrical Instruments Meters and Circuit Breakers

2130 Woolworth Bldg.
NEW YORK

WORKS
Bethlehem, Pa.

MONTREAL, Power Bldg.
NEW ORLEANS, Whitney Central Bldg.
PHILADELPHIA, Otis Bldg.
PITTSBURGH, 1306 Keenan Bldg.
SALT LAKE CITY, 313 Dooly Bldg.
ST. LOUIS, Railway Exchange Bldg.
ST. PAUL, Pioneer Bldg.
SAN FRANCISCO, 589 Howard St.
SCRANTON, Board of Trade Bldg.
SEATTLE, 524 First Ave., So.
TORONTO, 183 George St.

Made in Sizes
up to 7½ H.P.

Peerless Bulletins will give you the full details—send for them today.

## Peerless MOTORS

## Carry the Load

Continuous operation of your plant is a large factor in determining the amount of your profits. You can find a Peerless Motor so well adapted to your load that production will continue without trouble from power interruption.

Rigid construction without overweight; high starting torque, with 100% momentary overload capacity are the qualities that fit Peerless Motors for long and hard service in the West.

**Peerless Electric Company**
Warren, Ohio

**Garland-Affolter Engineering Company**
Western Representatives
San Francisco Seattle Los Angeles

# You Sell Satisfaction

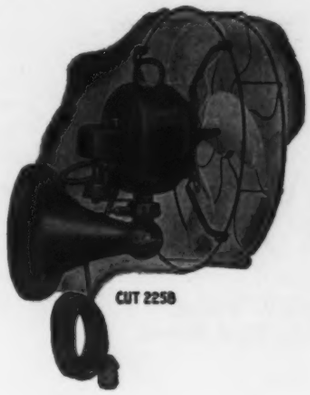
*with*

# Emerson Fans

The Emerson Line always "makes good." You sell enduring satisfaction if you sell Emersons.

All Emersons are sold with a five-year factory-to-user guarantee that is a real protection to the dealer as well as the user.

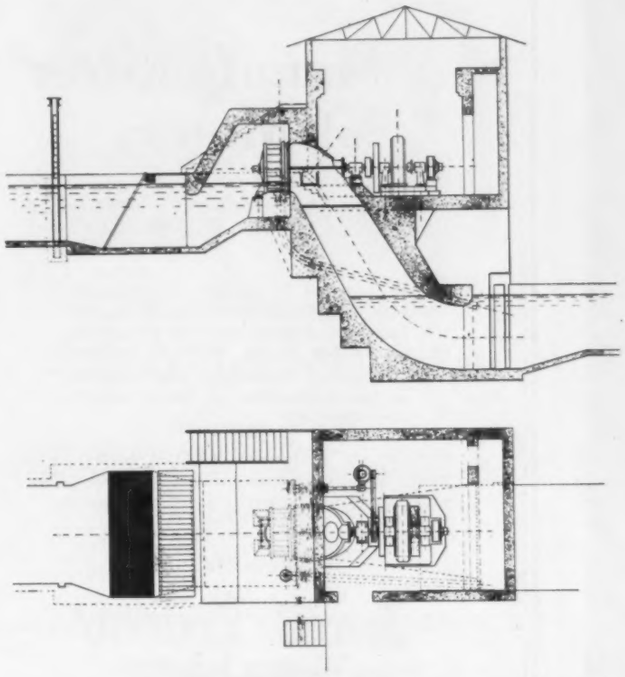
CUT 2255


CUT 2258

There is an Emerson type for every need — in the office or in the home.

**Get in touch with one of these coast jobbers. They can supply you directly from their stocks.**

| | |
|---|---|
| California Hardware Co. | Los Angeles, Cal. |
| Woodill & Hulse Electric Co. | Los Angeles, Cal. |
| Electric Appliance Co. | San Francisco, Cal. |
| Baker, Hamilton & Pacific Co. | San Francisco, Cal. |
| Electric Supplies Dist. Co. | San Diego, Cal. |
| Marshall-Wells Co. | Spokane, Wash. |
| Marshall-Wells Co. | Portland, Ore. |



# PELTON

## Low Head Turbines

Siphon chambers, as illustrated herewith, may be used to enclose the runners of vertical, as well as horizontal, turbines. The principal advantages are:

1. Placing the generator, etc., out of reach of flood water.
2. Recovery of residual energy from the discharged water by means of a long draft-tube, at the same time avoiding excessive excavation.

The time required to exhaust the air in the chamber is negligible, due to the provision of a powerful hydraulic ejector of special design.

**THE PELTON WATER WHEEL CO.**

*Hydraulic Engineers*

1991 Harrison Street, San Francisco

100 Broadway, New York

# FELT

Felt is used in so many mechanical and other manufactured products that it has taken years of experimental and research work to produce a line that comprehensively covers the requirements of the various trades.

Having manufactured and marketed Felts of all styles for a period of nineteen years, our experience has brought us in touch with frequent problems of the users of our product and permitted us to develop a knowledge of the grade of goods best adapted to obtain the most satisfactory results.

We would appreciate an opportunity of placing at your disposal any information which we may have. If you are now using Felt of any kind or contemplate its introduction into your work, do not hesitate to call upon us as there is no obligation in any way entailed.

## STANDARD FELT COMPANY

**Factories: WEST ALHAMBRA, CALIF.**

**BRANCHES**

| SAN FRANCISCO | CHICAGO | NEW YORK |
|---|---|---|
| 612 Howard Street | 404 S. Wells Street | 115 E. 23rd Street |

ADAPTABILITY
In the selection of materials used in the manufacture of Oshkosh Construction Tools, adaptability to the tool and the job is the first consideration. And in the design and manufacture of these good tools, adaptability to the men who are to use the tools is considered as carefully as adaptability to the work the tools are to perform. Correct materials, weight, balance, design and workmanship characterize Oshkosh Tools.
Oshkosh Manufacturing Co.,
106 Journal St., Oshkosh, Wisconsin
OSHKOSH
Construction Tools

# A Manufacturer of Motors

making a product of recognized quality and performance, desires a Representative for the Pacific Coast States.

**This line of motors and generators has large distribution in the East and a good business producing connection in the West is desired.**

**Generous assistance will be given in the promotion of these motors and generators.**

Write for full information on this proposition. Other lines of industrial and electrical equipment available.

**Business Manager**

**Journal of Electricity and Western Industry**

**Rialto Bldg. San Francisco**

# TRANSMISSION TOWERS
of
## Galvanized Steel

Every desired characteristic is combined in the manufacturing of Pacific Coast Steel Company's transmission towers.

**High Elastic Limit Steel**
**Accuracy of Shop Work** — **Basic Open Hearth Process**
**Correctness of Details** — **Extreme Ductility**
**Perfect Galvanized Surface** — **22% min. Elongation in 8″**
**Timely Deliveries for Field Erection**

These towers have been selected to carry the highest and largest voltage lines in the world.

## PACIFIC COAST STEEL CO.

**Manufacturers of Structural Shapes, Merchant and Reinforcing Bars**

**Main Office**
**Rialto Building, San Francisco**

**Works at**
**San Francisco, Portland, Seattle**

## Clifton Black Conduit
## Clifton Galvanized Conduit

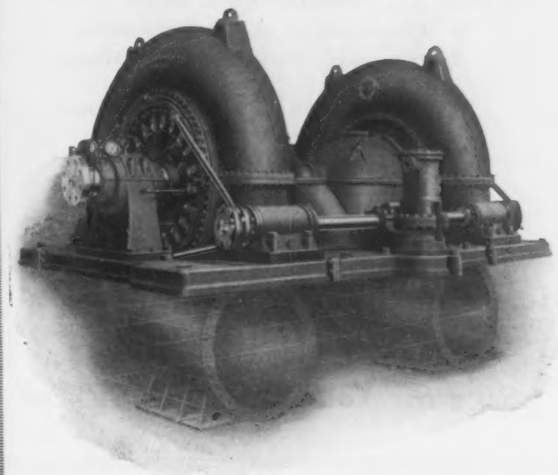
**Manufactured by**

**CLIFTON MANUFACTURING CO.**
**65 Brookside Ave.**
**BOSTON, 30, MASS.**

*Factories:*
**Jamaica Plain, Mass.** — **Buffalo, N. Y.**

*San Francisco Sales Representative:*
**KEELER, WHITE CO.**
**509 Mission Street**

## SMITH HYDRAULIC TURBINES



**In the Rainbow Plant of Montana Power Company are installed Eight Twin-Wheel, Double Scroll Case Hydraulic Turbine Units similar to the above illustration, developing 64,000 Hp. under 108 Ft. Head.**

If interested, write Dept. "H" for Bulletin describing this and other developments.

**S. MORGAN SMITH CO., York, Pa.**

*Branch Offices:*

| BOSTON | CHICAGO | MONTREAL | SALT LAKE CITY |
|---|---|---|---|
| 176 Federal St. | 76 W. Monroe St. | 405 Power Bldg. | 521 McIntyre Bldg. |
| ATLANTA | SAN FRANCISCO | PORTLAND, ORE. | |
| Citizens & Southern Bank Bldg. | 461 Market St. | 224 Pine St. | |

*The most up-to-date authority on high tension practice of today*

# Protective Relays

— BY —

VICTOR H. TODD

1922

274 Pages **Price $2.50** 244 Illustrations and Diagrams

A comprehensive book on the theory, design, and practical operation of protective relays for the operator, tester, and designer of high tension systems.

CONTENTS

I What are Protective Relays?
II Circuit Breakers and Releases
III Trip Circuits and Time Relays
IV Plunger-Type Protective Relays
V D.C. Power-Directional Relays
VI Applications of D.C. Power-Directional Relays
VII Induction-Type Current Relays
VIII A.C. Power-Directional Relays
IX Characteristics of A.C. Disturbances
X Instrument Transformers and Groupings
XI Protection of Motors, Transformers, Generators and Lines
XII Protection of Parallel Feeders
XIII Protection of Radial Ring and Network Systems
XIV Miscellaneous Relays
XV Testing Direct-Current Relays
XVI Testing Alternating-Current Relays
XVII Locating Faults in Feeders and Mining

***Send for Your Copy TODAY!***

Technical Book Shop,
Journal of Electricity and Western Industry,
Rialto Building, San Francisco, Cal.

Gentlemen: Enclosed find $2.50, for which send me a copy of Todd's Protective Relays.

Name .....

Address .....

.....

# WHERE TO BUY

CLASSIFIED INDEX TO ADVERTISERS

**Alarms, Burglar & Fire**
Pacific States Electric Company

**Anchors, Guy**
Baker-Joslyn Company
Electric Appliance Company
Hubbard & Company
Matthews & Bro., Inc., W. N.
Pacific States Electric Company
Western Electric Company

**Annunciators**
Western Electric Company

**Appliances, Household**
Air-O-Mix Corp., The
Altorfer Bros. Co.
Apex Electrical Distributing Co.
Edison Electric Appliance Co.
Electric Appliance Company
Electro Weld Co.
Estate Stove Co.
Federal Electric Co.
Geier Company, The P. A.
Household Engineering Works
Hurley Machine Company
1900 Washer Co.
Pacific States Electric Company
Play-O-Lite Company
Reiman Wholesale Elec. Co.
Rutenber Electric Co.
Shelton Electric Co.
Sunbeam Domestic Appliance Co.
Sunny Line Appliances, Inc.
Waage Electric Co.
Walker & Pratt Mfg. Co.
Weeks Mfg. Co., H. G.
Western Electric Company

**Arms, Cross**
Baker-Joslyn Company
Benjamin Electric Mfg. Co.
Hubbard & Company
Pacific States Electric Company
Western Electric Company

**Arresters, Lightning**
Electrical Engineers Equip. Co.
General Electric Company
Hubbard & Company
Pacific States Electric Company
Schweitzer & Conrad, Inc.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Automobile Accessories**
Benjamin Electric Mfg. Company
Cutler-Hammer Mfg. Co.
Electric Appliance Company
Harvey Hubbell, Inc.
Johns-Manville, Inc.
National Metal Molding Co.
Roller-Smith Company
Western Electric Company

**Batteries**
Edison Storage Battery Co.
Electric Appliance Company
Pacific States Electric Company
Western Electric Company

**Battery Charging Apparatus**
Cutler-Hammer Mfg. Co.
Electric Appliance Company
General Electric Company
Pacific States Electric Company
Wagner Electric Mfg. Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Bells, Electric**
Pacific States Electric Company
Western Electric Company

**Boilers, Steam**
Moore & Company, Chas. C.

**Bolts, Expansion & Galvanized**
Baker-Joslyn Company
Pacific States Electric Company
Western Electric Company

**Books, Technical**
McGraw-Hill Book Co., Inc.

**Boxes, Junction, Outlet, Meter and Fuse**
Baker-Joslyn Company
Electric Appliance Company
Johns-Manville, Inc.
Pacific States Electric Company
Reiman Wholesale Elec. Co.
Sprague Electric Works
Standard Underground Cable Co.
Steel City Electric Co.
Trumbull Electric Mfg. Co.
V.V. Fittings Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Braces, Cross Arm**
Baker-Joslyn Company
Hubbard & Company
Pacific States Electric Company
Western Electric Company

**Brackets, Pole and Wall**
Baker-Joslyn Company
Benjamin Electric Mfg. Co.
Hubbard & Company
Locke Insulator Corp.
National Metal Molding Company
Pacific States Electric Company
Westinghouse Electric & Mfg. Co.

**Brushes, Carbon and Graphite**
Morganite Brush Co., Inc.

**Bus Bars, Supports**
American Copper Products Corp.
Delta-Star Electric Co.
Elec. Power Equipment Corp.
General Electric Company
Schweitzer & Conrad, Inc.
Westinghouse Electric & Mfg. Co.

**Cable and Accessories**
Baker-Joslyn Company
Electric Appliance Company
Electrical Engineers Equip. Co.
General Electric Company
Pacific States Electric Company
Simplex Wire & Cable Co.
Standard Underground Cable Co.
Westinghouse Electric & Mfg. Co.

**Cars, Street Railway**
Brill Company, The J. G.

**Christmas Tree Outfits**
Electric Appliance Company
Pacific States Electric Company
Reiman Wholesale Elec. Co.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Circuit Breakers**
Condit Electrical Mfg. Co.
Electric Appliance Company
General Electric Company
Pacific States Electric Company
Roller-Smith Company
Schweitzer & Conrad, Inc.
Trumbull Electric Mfg. Co.
Ward Leonard Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Clamps**
Baker-Joslyn Company
Electrical Engineers Equip. Co.
Hubbard & Company
Locke Insulator Corp.
Matthews & Bro., Inc., W. N.
Pacific States Electric Company
States Company, The
Thomas & Sons Company, R.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Cleats, Porcelain**
Baker-Joslyn Company
Pacific States Electric Company
Thomas & Sons Company, R.
Western Electric Company

**Climbers**
Baker-Joslyn Company
Klein & Sons, Mathias
Pacific States Electric Company
Western Electric Company

**Clusters**
Benjamin Electric Mfg. Co.
Pacific States Electric Company
Western Electric Company

**Coils**
Crocker-Wheeler Company
Electric Appliance Company
General Electric Company
Pacific States Electric Company
Schweitzer & Conrad, Inc.
States Company, The
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Commutators**
Harvey Electric Co.

# WHERE TO BUY

## CLASSIFIED INDEX TO ADVERTISERS

**Compounds, Insulating and Splicing**
Baker-Joslyn Company
Johns-Manville, Inc.
Pacific States Electric Company
Standard Underground Cable Co.
V.V. Fittings Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Concentric Wiring Fittings**
Western Electric Company

**Condensers, Steam**
Allis-Chalmers Mfg. Company
Moore & Company, Chas. C.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Conductors, Armored**
Electric Appliance Company
National Metal Molding Co.

**Conduit**
American Wiremold Co.
Baker-Joslyn Cmpany
Clifton Mfg. Co.
Electric Appliance Company
Johns-Manville, Inc.
National Metal Molding Company
Pacific States Electric Company
Sprague Electric Works
Western Electric Company

**Conduit Fittings**
American Wiremold Co.
Baker-Joslyn Company
Chicago Fuse Mfg. Co.
Electric Appliance Company
National Metal Molding Company
Pacific States Electric Company
Reiman Wholesale Elec. Co.
Sprague Electric Works
V.V. Fittings Company
Western Electric Company

**Connectors**
Austin Company, The M. B.
Sherman Mfg. Company, H. B.
States Company, The
Westinghouse Electric & Mfg. Co.

**Contactors, A.C. and D.C.**
Cutler-Hammer Mfg. Co.
Electric Controller & Mfg. Co.
General Electric Company
Westinghouse Electric & Mfg. Co.

**Controllers, Motor**
Crocker-Wheeler Company
Cutler-Hammer Mfg. Co.
Electric Appliance Company
Electric Controller & Mfg. Co.
General Electric Company
Wagner Electric Mfg. Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Converters**
General Electric Company
Wagner Electric Mfg. Company
Westinghouse Electric & Mfg. Co.

**Cord**
Baker-Joslyn Company
Collyer Insulated Wire Co.
Electric Appliance Company
Pacific States Electric Company
Rockbestos Products Corp.
Simplex Wire & Cable Co.
Western Electric Company

**Cut-Outs**
Arrow Electric Company
Chicago Fuse Mfg. Co.
D & W Fuse Works of G. E. Co.
Electric Appliance Company
Johns-Manville, Inc.
Pacific States Electric Company
Schweitzer & Conrad, Inc.
Western Electric Company
Ward Leonard Electric Company
Westinghouse Electric & Mfg. Co.

**Dimmers, Theater**
Cutler-Hammer Mfg. Co.
General Electric Company
Pacific States Electric Company
Western Electric Company
Ward Leonard Electric Company

**Dynamos**
Allis-Chalmers Mfg. Company
Crocker-Wheeler Company
General Electric Company
Peerless Electric Co.
Ridgway Dynamo & Engine Co.
Wagner Electric Mfg. Company
Westinghouse Electric & Mfg. Co.

**Engineers, Construction**
Stone & Webster, Inc.

**Engines, Gas and Steam**
Allis-Chalmers Mfg. Company
Fairbanks-Morse & Company
Moore & Company, Chas. C.
Westinghouse Electric & Mfg. Co.

**Fans, Portable, Ceiling**
Century Electric Company
Electric Appliance Company
General Electric Company
Pacific States Electric Company
Peerless Electric Co.
Robbins & Myers Company
Sprague Electric Works
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Fans, Exhaust**
Allis-Chalmers Mfg. Company
Pacific States Electric Company
Peerless Electric Co.
Sprague Electric Works
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Fault Finders, Electric**
Electric Controller & Mfg. Co.
Westinghouse Electric & Mfg. Co.

**Fibre**
American Vulcanized Fibre Co.
Baker-Joslyn Company
Johns-Manville, Inc.
Pacific States Electric Company
The Continental Fibre Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Filtering Materials**
Celite Products Co.

**Fixtures, Fixture Parts**
Arrow Electric Company
Benjamin Electric Mfg. Company
Duplex Lighting Works
Electric Appliance Company
Harvey Hubbell, Inc.
National Metal Molding Co.
National X-Ray Reflector Co.
Pacific States Electric Company
Pass & Seymour
Sherman Mfg. Company, H. B.
V.V. Fittings Company
Western Electric Company
Williamson Company, R.

**Flash Lights, Electric**
Electric Appliance Company
Pacific States Electric Company
Trumbull Electric Mfg. Company
Western Electric Company

**Flood Light Projectors**
General Electric Company
National X-Ray Reflector Co.
Westinghouse Electric & Mfg. Co.

**Fuses and Fuse Specialties**
Baker-Joslyn Company
Chicago Fuse Mfg. Company
D & W Fuse Works of G. E. Co.
Electric Appliance Company
Federal Electric Company
Johns-Manville, Inc.
Pacific States Electric Company
Schweitzer & Conrad, Inc.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Gloves, Rubber**
Mathias-Hart Co.

**Governors**
Allis-Chalmers Mfg. Company
General Electric Company
Pelton Water Wheel Co.
Woodward Governor Co.

**Guards, Lamp**
Benjamin Electric Mfg. Company
Harvey Hubbell, Inc.
Matthews & Bro., Inc., W. N.
Pacific States Electric Company
Western Electric Company

**Hangers, Lamp, Fixture, Cable**
Baker-Joslyn Company
Hubbard & Company
Pacific States Electric Company
Standard Underground Cable Co
The Ohio Brass Company
Western Electric Company
Westinghouse Electric & Mfg. Co.


# RAVEN CORE

*—A Rubber Covered Wire of Distinction!*

Made by a house of standing.
Specified by all the leading architects.
Used by the Contractors who do the better grade of work.

Can you afford to overlook it?

**New York Insulated Wire Co.**
Main Office: NEW YORK
Factory: WALLINGFORD, CONN.

Agencies and Branches
DENVER SAN FRANCISCO CHICAGO BOSTON

CALIFORNIA WIRE

THIS Pacific Coast organization, planned, financed and operated entirely by Californians, solicits your inquiries and specifications for "CALIFORNIA" Weatherproof Wires and Cables, on a strictly competitive basis.

It Pays to Get Acquainted with "California Wire."

**California Wire Co.**
Orange, California

CHAS. C. MOORE & CO. ENGINEERS INC.

**Contractors for Complete Plants**

**HIGH GRADE MACHINERY**

The Babcock & Wilcox Water tube boilers
Corliss, High Speed, and Poppet valve engines
Babcock & Wilcox superheaters
Nordberg hoists and compressors
Green's fuel economizers
Wheeler Condenser & Engineering Co. Condensing machinery
Cochrane feed water heaters
Sorge-Cochrane feed water softeners
Cochrane feed water metering heaters
Cochrane steam separators
Reilly evaporators, distillers and feed water heaters
Criscom-Russell multiwhirl coolers
Moore automatic fuel oil regulators
Diamond soot blowers
Lagonda tube cleaners
Copes feed water regulators
Lagonda automatic boiler stop valves
Leslie reducing valves
Turner oil filters

And All Power Plant Auxiliaries

Address our nearest office for catalogs and complete information

Home Office: SAN FRANCISCO, Sheldon Bldg.

New York City, Hudson Terminal Bldg.

Los Angeles, I. N. Van Nuys Bldg. Seattle, L. C. Smith Bldg.
Salt Lake City, 705-6 Kearns Bldg. Tucson, 21 South Stone Ave.
Honolulu, T. H.

**—OHIO—**
**Lifting Magnets**
**are best for**

Magnetic Separation to remove tramp iron in front of Crushing Rolls.

Coils of Ohio Magnets are all asbestos insulated, therefore will stand current continuously.

Ask Us

**Ohio Electric & Controller Co.**
Cleveland - - - Ohio

Representative:
A. S. Lindstrom, San Francisco, Cal.



**COPPER WIRE**

Bare and Insulated
for every kind of
electrical work.

COPPER RODS TROLLEY WIRES

Rome-Wire

**ROME WIRE COMPANY**
Main Plant and Executive Office, ROME, N. Y.
"Diamond" Branch BUFFALO, N. Y.

DISTRICT SALES OFFICES

NEW YORK
50 Church St.

DETROIT, MICH.
25 Parsons St.

CHICAGO, ILL.
14 E. Jackson Blvd.

LOS ANGELES, CAL.
J. G. Pomeroy
336 Azusa St.


# WHERE TO BUY

CLASSIFIED INDEX TO ADVERTISERS

**Headlights, Electric**
General Electric Company
Westinghouse Electric & Mfg. Co.

**Heat Insulation Materials**
Celite Products Co.

**Heating Appliances, Domestic**
Cutler-Hammer Mfg. Co.
Edison Electric Appliance Co.
Electric Appliance Company
Empire Transformer Co.
Estate Stove Co.
General Electric Company
Hicks, W. Wesley
Magee Furnace Co.
Majestic Electric Development Co.
Northern Electric Co.
Reiman Wholesale Elec. Co.
Rutenber Electric Co.
Simplex Electric Heating Co.
Wange Electric Co.
Walker & Pratt Mfg. Co.
Weeks Mfg. Co., H. G.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Hoists, Electric**
Fairbanks-Morse & Company
Moore & Company, Chas. C.
Sprague Electric Works
Western Electric Company

**Hoods, Street**
Benjamin Electric Mfg. Company
Pacific States Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Industrial Signals**
Benjamin Electric Mfg. Company

**Instruments, Recording, Testing**
Electric Appliance Company
Johns-Manville, Inc.
Pacific States Electric Company
Roller-Smith Company
Sangamo Electric Co.
Schweitzer & Conrad, Inc.
States Company, The
Western Electric Company

**Insulated Screwdriver Pliers**
Rubber Insulated Metals Co.

**Insulators**
Baker-Joslyn Company
Electric Appliance Company
General Electric Company
Hemingray Glass Co.
Johns-Manville, Inc.
Lapp Insulator Co., Inc.
Locke Insulator Corp.
Pacific States Electric Company
The Ohio Brass Company
Thomas & Sons Company, R.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Insulating Material**
American Vulcanized Fibre Co.
Baker-Joslyn Company
Cutler-Hammer Mfg. Co.
D & W Fuse Works of G. E. Co.
Delta-Star Electric Co.
Electric Appliance Company
General Electric Company
Johns-Manville, Inc.
Pacific States Electric Company
Standard Underground Cable Co.
The Continental Fibre Company
Westinghouse Electric & Mfg. Co.

**Lamps, Arc**
Pacific States Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Lamps, Incandescent**
Edison Lamp Works
Electric Appliance Company
National Lamp Works
Pacific States Electric Company
Reiman Wholesale Elec. Co.
Western Electric Company
Westinghouse Lamp Company

**Lamp Standards**
Pacific States Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Lighting Outfits**
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Lightning Arresters**
General Electric Company
Westinghouse Electric & Mfg. Co.

**Line Material, Pole, Railway**
Baker-Joslyn Company
Electric Appliance Company
General Electric Company
Hubbard & Company
Johns-Manville, Inc.
Locke Insulator Corp.
Pacific States Electric Company
The Ohio Brass Company
Thomas & Sons Company, R.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Locknuts & Bushings**
Electric Appliance Company
National Metal Molding Co.

**Machinery, Mining**
Allis-Chalmers Mfg. Company
General Electric Company

**Magnets, Lifting**
Cutler-Hammer Mfg. Co.
Electric Controller & Mfg. Co.
Ohio Electric & Controller Co.

**Marine Lighting & Signaling Apparatus**
Benjamin Electric Mfg. Co.
General Electric Company
Westinghouse Electric & Mfg. Co.

**Meters**
Duncan Electric Mfg. Co.
Electric Appliance Company
General Electric Company
Roller-Smith Company
Sangamo Electric Co.
Spray Engineering Co.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Meter Testers**
States Company, The

**Molding, Metal, Wood**
American Wiremold Co.
Electric Appliance Company
National Metal Molding Company
Pacific States Electric Company
Western Electric Company

**Motors, A.C., D.C.**
Allis-Chalmers Mfg. Company
Century Electric Company
Crocker-Wheeler Company
Electric Appliance Company
Fairbanks-Morse & Company
General Electric Company
Howell Electric Motors Company
Jeannin Electric Co.
Mechanical Appliance Co.
Northwestern Electric Co.
Ohio Electric & Controller Co.
Peerless Electric Co.
Robbins & Myers Company
Sprague Electric Works
U. S. Electrical Mfg. Co.
Wagner Electric Mfg. Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Motor Generators**
General Electric Company
Peerless Electric Co.
Ridgway Dynamo & Engine Co.
Sprague Electric Works
Wagner Electric Mfg. Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Motor Starters**
Condit Electrical Mfg. Co.
Crocker-Wheeler Company
Cutler-Hammer Mfg. Co.
Electric Controller & Mfg. Co.
General Electric Company
Pacific States Electric Company
Trumbull Electric Mfg. Co.
Wagner Electric Mfg. Company
Western Electric Company
Ward Leonard Electric Company
Westinghouse Electric & Mfg. Co

**Oil Burners and Systems**
Moore & Company, Chas. C.

# WHERE TO BUY

CLASSIFIED INDEX TO ADVERTISERS

**Oil Fuse Cutouts, Aerial and Underground**
D & W Fuse Works of G. E. Co.

**Outlet Boxes and Covers**
Austin Company, The M. B.
Chicago Fuse Mfg. Co.
Electric Appliance Company
National Metal Molding Co.

**Ozonators**
Pacific States Electric Company
Sprague Electric Works

**Paint, Insulating**
Baker-Joslyn Company
Electric Appliance Company
Johns-Manville, Inc.
Pacific States Electric Company
Westinghouse Electric & Mfg. Co.

**Paints and Varnishes, Protective**
Hill Hubbell & Co.

**Paint Sprayers**
Matthews & Bro., Inc., W. N.

**Panel Boards, Panels**
Benjamin Electric Mfg. Company
Cutler-Hammer Mfg. Co.
Electric Appliance Company
Pacific States Electric Company
Sprague Electric Works
Ward Leonard Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Pins, Wood, Iron, Steel**
Baker-Joslyn Company
Hubbard & Company
Locke Insulator Corp.
Pacific States Electric Company
Thomas & Sons Company, R.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Pipe, Pressure**
Kellogg Company, The M. W.

**Plates, Flush Switch**
Atlantic Elec. Goods Co., Inc.
Pacific States Electric Company
Western Electric Company

**Pliers, Insulated**
Mathias-Hart Co.

**Plugs, Receptacles, Sockets**
Ajax Electric Specialty Co.
Arrow Electric Company
Benjamin Electric Mfg. Company
Bryant Electric Co.
Cutler-Hammer Mfg. Co.
Electric Appliance Company
Harvey Hubbell, Inc.
Hyman & Co., Henry
McGill Mfg. Co.
National X-Ray Reflector Co.
Pacific States Electric Company
Pass & Seymour
Richards & Co., Geo.
V.V. Fittings Company
Western Electric Company

**Poles, Iron, Steel, Wood**
Baker-Joslyn Company
Bates Expanded Steel Truss Co.
Pacific Coast Steel Co.
Pacific States Electric Company
Western Electric Company

**Pole Jacks**
Templeton, Kenly & Co., Ltd.

**Porcelain Specialties**
Electric Appliance Company
Locke Insulator Corp.
Thomas & Sons Company, R.

**Potheads**
G & W Electric Specialty Co.
Johns-Manville, Inc.
Standard Underground Cable Co.
Westinghouse Electric & Mfg. Co.

**Power Plants**
Allis-Chalmers Mfg. Company
General Electric Company
Moore & Company, Chas. C.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Projectors, Electric**
General Electric Company
National X-Ray Reflector Co.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Protective Devices**
Condit Electrical Mfg. Co.

**Pumps**
Fairbanks-Morse & Company
Moore & Company, Chas. C.
Pelton Water Wheel Company
Westinghouse Electric & Mfg. Co.

**Push Buttons**
Arrow Electric Company
Benjamin Electric Mfg. Company
Electric Appliance Company
Pacific States Electric Company
Western Electric Company

**Rail Bonds**
General Electric Company
The Ohio Brass Company
Westinghouse Electric & Mfg. Co.

**Rectifiers**
Electric Appliance Company
General Electric Company
Pacific States Electric Company
Wagner Electric Mfg. Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Reflectors**
Benjamin Electric Mfg. Company
Duplex Lighting Works
Harvey Hubbell, Inc.
Ivanhoe Regent Works
National X-Ray Reflector Co.
Pacific States Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Regulators, Voltage**
General Electric Company
Ward Leonard Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Reinforcing Bars**
Pacific Coast Steel Co.

**Relays**
Condit Electrical Mfg. Co.
General Electric Company
Roller-Smith Company
Westinghouse Electric & Mfg. Co.

**Resistances**
Cutler-Hammer Mfg. Company
Electric Appliance Company
Electric Controller & Mfg. Co.
General Electric Company
Ward Leonard Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Rheostats**
Cutler-Hammer Mfg. Co.
Electric Appliance Company
General Electric Company
Pacific States Electric Company
Ward Leonard Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Rosettes**
Arrow Electric Company
Electric Appliance Company
General Electric Company
Pacific States Electric Company
Pass & Seymour

**Searchlights**
General Electric Company
Pacific States Electric Company
Western Electric Company

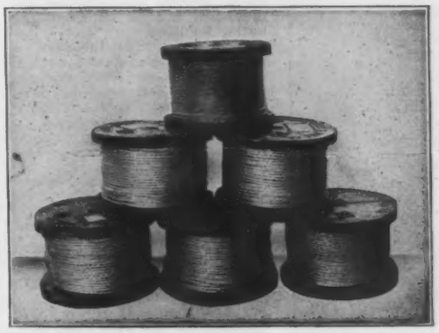
**Slate**
Westinghouse Electric & Mfg. Co.

**Solder, Self-fluxing, Solid Wire and Bar**
Baker-Joslyn Company
Pacific States Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Solenoids**
Electric Controller & Mfg. Co.
Westinghouse Electric & Mfg. Co.

**Steel, Structural**
Pacific Coast Steel Co.


## GALVANIZED STEEL STRAND



Commercial Grade, Single and Double Galvanized. Siemens-Martin and High Strength grades, Double Galvanized. 3-ply Wore for Special Purposes.

FOR ELECTRICAL TRANSMISSION AND DISTRIBUTION—OVERHEAD RESISTANCE

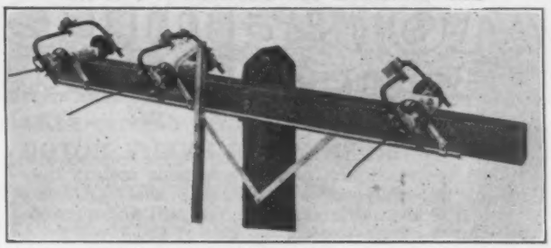
**Double Galvanized Telephone and Telegraph Wire.**

E.B.B. B.B and Steel
Pacific Coast Representation

INDIANA STEEL & WIRE COMPANY,
MUNCIE, - - INDIANA.

## K-P-F SWITCHES

Reduce Your Installation and Maintenance Costs



K-P-F type L-115—4500-V. Bolts to the cross-arm. Line wires can be dead ended directly to it.

K-P-F ELECTRIC COMPANY
37 Stevenson St. San Francisco

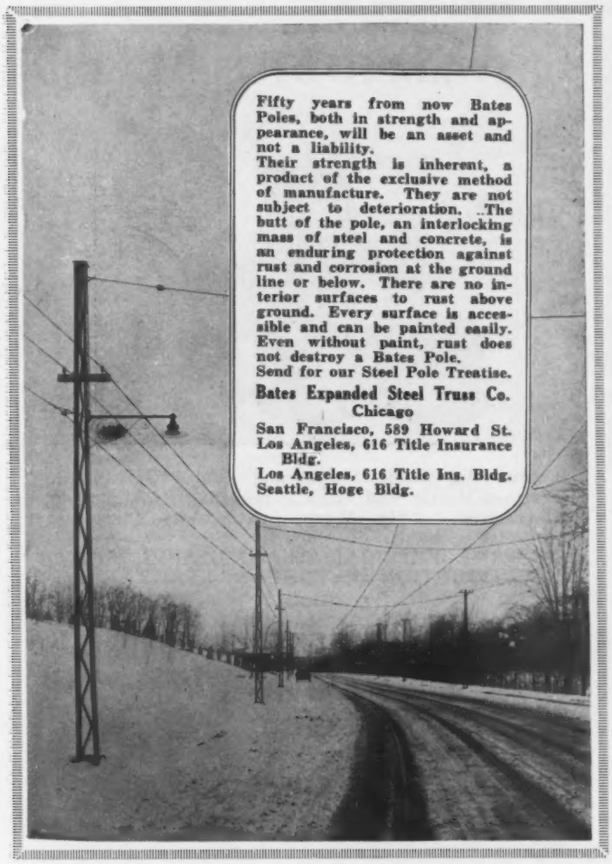
## STANDARD

This name applied to electric wires and cables means what "Sterling" does when applied to silver—a guarantee of quality recognized by all discriminating buyers. We will appreciate an opportunity to demonstrate STANDARD Quality.

*Write our nearest office*

Standard Underground Cable Company

Pacific Coast Department:
San Francisco, Seattle, Los Angeles, Salt Lake City
Factory in Oakland
For Canada:
Standard Underground Cable Co., of Canada, Limited
Hamilton, Ontario


Fifty years from now Bates Poles, both in strength and appearance, will be an asset and not a liability.
Their strength is inherent, a product of the exclusive method of manufacture. They are not subject to deterioration. The butt of the pole, an interlocking mass of steel and concrete, is an enduring protection against rust and corrosion at the ground line or below. There are no interior surfaces to rust above ground. Every surface is accessible and can be painted easily. Even without paint, rust does not destroy a Bates Pole.
Send for our Steel Pole Treatise.
Bates Expanded Steel Truss Co.
Chicago
San Francisco, 589 Howard St.
Los Angeles, 616 Title Insurance Bldg.
Los Angeles, 616 Title Ins. Bldg.
Seattle, Hoge Bldg.

Morganite Brush Co., Inc.

519 West 38th Street New York City

CARBON BRUSHES FOR EVERY MOTOR

To get the maximum power from your motors they should be equipped with brushes that are best adapted to each different type. You will find our representatives know exactly the kind of brush you need.

*Call On Them At Any Time*

PACIFIC COAST REPRESENTATIVES AND ENGINEERS

Herzog Elec. & Eng. Co.
150 Steuart St., San Francisco

Special Service Sales Co., 502 Delta Bldg., Los Angeles

W. R. Hendrey Co., Hoge Bldg., Seattle

THE intensiveness with which the Journal of Electricity and Western Industry covers the electrical field in the West makes it an advertising medium second to none in the advertising of any product associated with electricity in the eleven Western states.

THE aim of the advertising department is to cooperate, in any way possible with advertisers, to the end that the best results may be obtained from the use of space in the Journal.

# WHERE TO BUY

## CLASSIFIED INDEX TO ADVERTISERS

**Sterilizers, Electric**
Weeks Mfg. Co., H. G.

**Street Lighting**
General Electric Company
Westinghouse Electric & Mfg. Co.

**Sub-stations**
Electrical Engineers Equip. Co.
Schweitzer & Conrad, Inc.
Westinghouse Electric & Mfg. Co.

**Switchboards**
Allis-Chalmers Mfg. Company
Condit Electrical Mfg. Co.
Electric Appliance Company
Elec. Power Equipment Corp.
General Electric Company
Pacific States Electric Company
Trumbull Elec. Mfg. Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Switches, High Tension**
Allis-Chalmers Mfg. Company
Condit Electrical Mfg. Co.
Delta-Star Electric Co.
Electrical Engineers Equip. Co.
Elec. Power Equipment Corp.
General Electric Company
K-P-F Electric Co.
Matthews & Bro., Inc., W. N.
Schweitzer & Conrad, Inc.
Trumbull-Vanderpoel Elec. Mfg. Co.
Westinghouse Electric & Mfg. Co.

**Switches, House Service**
Arrow Electric Co.
Benjamin Electric Mfg. Co.
Condit Electrical Mfg. Co.
Cutler-Hammer Mfg. Co.
Electric Appliance Company
Elec. Power Equipment Corp.
General Electric Company
Johns-Manville, Inc.
Reiman Wholesale Elec. Co.
Square D Company
Trumbull-Vanderpoel Elec. Mfg. Co.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Switches, Motor Controlling**
Baker-Joslyn Company
Condit Electrical Mfg. Co.
Cutler-Hammer Mfg. Co.
Electric Appliance Company
Electric Controller & Mfg. Co.
Elec. Power Equipment Corp.
General Electric Company
Johns-Manville, Inc.
Pacific States Electric Company
Safety Electric Prod. Co., Inc.
Schweitzer & Conrad, Inc.
Square D Company
Trumbull Electric Mfg. Co.
Trumbull-Vanderpoel Elec. Mfg. Co.
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Switches, Time**
Cramer & Co., R. W.

**Tanks, Iron and Steel**
Riter-Conley Company

**Tape**
Baker-Joslyn Company
Clifton Mfg. Co.
Electric Appliance Company
General Electric Company
Johns-Manville, Inc.
New York Insulated Wire Co.
Pacific States Electric Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Telephone Equipment**
Johns-Manville, Inc.
Pacific States Electric Company
Western Electric Company

**Terminals**
States Company, The

**Tools, Construction**
Baker-Joslyn Company
Electric Appliance Company
Hubbard & Company
Klein & Sons, Mathias
Oshkosh Mfg. Co.
Pacific States Electric Company
Western Electric Company

**Torches, Alcohol**
Hunt-Lasher Co., Inc.

**Toys, Electric**
Ives Mfg. Company
Lionel Corp., The
Weeks Mfg. Co., H. G.

**Towers, Steel**
Bates Expanded Steel Truss Co.
Pacific Coast Steel Co.
Pacific States Electric Company
Riter-Conley Company

**Transformers**
Allis-Chalmers Mfg. Company
Crocker-Wheeler Company
Duncan Electric Mfg. Company
General Electric Company
Kuhlman Electric Company
Pacific States Electric Company
Packard Electric Co.
States Company, The
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Trolley Line Material**
Brill Company, The J. G.
Electric Appliance Company
General Electric Company
Johns-Manville, Inc.
Pacific States Electric Company
The Ohio Brass Company
Western Electric Company
Westinghouse Electric & Mfg. Co.

**Turbines, Hydraulic, Water Wheels**
Allis-Chalmers Mfg. Company
Cramp & Sons Co., The Wm.
Pelton Water Wheel Company
Ridgway Dynamo & Engine Co.
Smith Company, S. Morgan

**Turbines, Steam**
Allis-Chalmers Mfg. Company
General Electric Company
Ridgway Dynamo & Engine Co.
Westinghouse Electric & Mfg. Co.

**Valves, Sluice and Gate**
Coffin Valve Co.

**Vibrators**
Shelton Electric Co.

**Washers, Air**
Spray Engineering Co.

**Water Heaters**
Automatic Electric Heater Co.
Duralectric Corp.
Hicks, W. Wesley

**Welding Apparatus, Electric**
General Electric Company
Pacific States Electric Company
The Ohio Brass Company
Western Electric Company

**Wire, Bare Copper, Aluminum**
American Copper Products Corp.
American Ins. Wire & Cable Co.
Anaconda Copper Mining Co.
Baker-Joslyn Company
Electric Appliance Company
Pacific States Electric Company
Phillips Wire Co.
Rockbestos Products Corp.
Roebling's Sons Co.
Rome Wire Co.
Simplex Wire & Cable Co.
Standard Underground Cable Co.
Western Electric Company

**Wire, Covered, Enamelled, Galvanized**
American Ins. Wire & Cable Co.
Baker-Joslyn Company
California Wire Co.
Collyer Insulated Wire Co.
Electric Appliance Company
Indiana Rubber & Insul. Wire Co.
Indiana Steel & Wire Co.
Johns-Manville, Inc.
National Metal Molding Co.
New York Insulated Wire Co.
Pacific States Electric Company
Phillips Wire Co.
Reiman Wholesale Elec. Co.
Rockbestos Products Corp.
Roebling's Sons Co.
Rome Wire Co.
Simplex Wire & Cable Co.
Sprague Electric Works
Standard Underground Cable Co.
Western Electric Company

**Wiring Devices**
Hubbell, Inc., Harvey

**Wiring Supplies**
Short Electrical Mfg. Co.

# Here's the third gun in the Store Lighting Campaign—

*in The Saturday Evening Post of July 22*

IF YOU have started your store lighting campaign, this page will help you sell more prospects.

If you are just starting, it will prepare the merchants in your vicinity for your first calls.

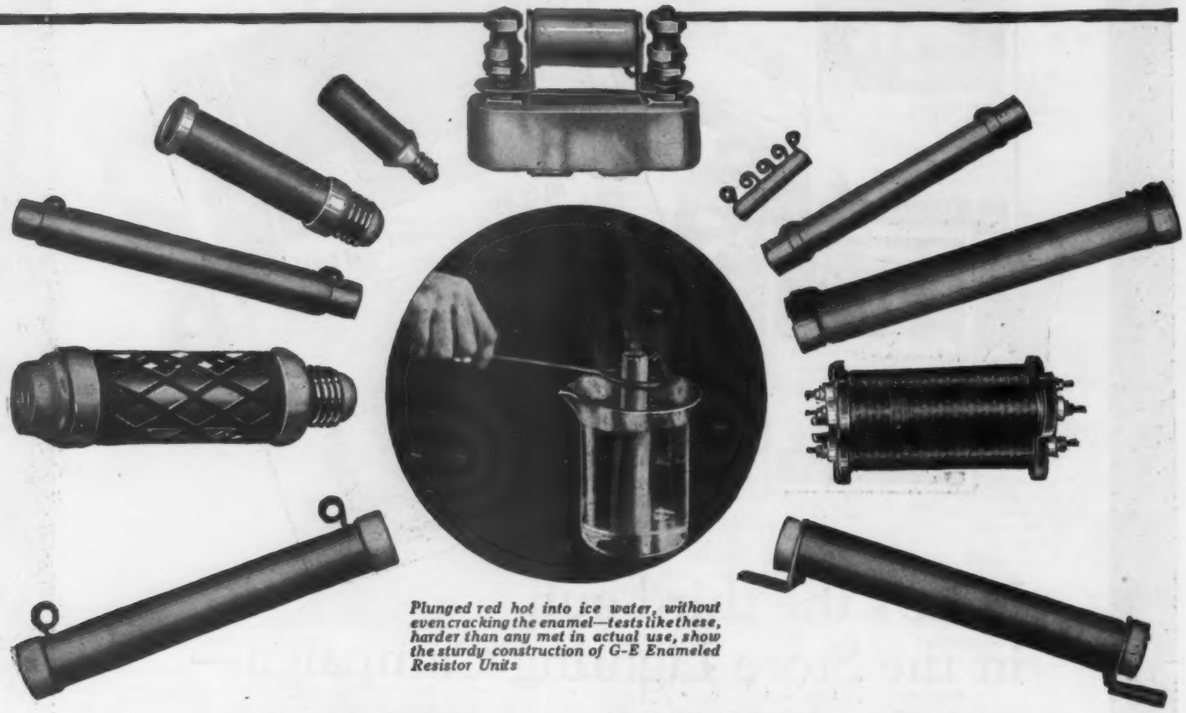
The Store Lighting Sales Portfolio suggests how you may take full advantage of this advertisement and the others which have gone before. Edison MAZDA Lamp Agents everywhere report that with the aid of the national magazine advertising, the Sales Portfolio and the special Agent helps, they are bringing in new and profitable business during what is ordinarily the slack season of the year.

And here's some more interesting news. The back cover of The Ladies' Home Journal for August will carry a four color advertisement of Edison MAZDA Lamps for home lighting. The illustration is by Norman Rockwell.

EDISON
MAZDA LAMPS

EDISON LAMP WORKS OF GENERAL ELECTRIC COMPANY

*Resistor Units, to give dependable and economical performance wherever used, must resist moisture and withstand extreme changes in temperature*



*Plunged red hot into ice water, without even cracking the enamel—tests like these, harder than any met in actual use, show the sturdy construction of G-E Enameled Resistor Units*

## G-E Resistors give unfailing service in many and various applications

G-E Blue-Enameled Resistor Units are used extensively in connection with railway and fire alarm signals, locomotive headlights, telephone circuits, magnets, laboratory and measuring instruments, rheostats, panels, and small motors.

The General Electric Company can furnish these units in practically any variety that may be required, and in colors other than the standard blue.

G-E Enameled Resistor Units have a mechanically strong, high-heat resisting silicate compound body which will withstand all extreme temperature fluctuations without cracking, weakening or in any way being injured.

The resistance winding is protected by a moisture-proof vitreous enamel and the entire surface of the tube is available for dissipation of heat.

**General Electric Company**

General Office Schenectady, N.Y.

Sales Offices in all large cities

43A-76

Pacific Coast Sales Offices: San Francisco, Los Angeles, Portland, Seattle, Spokane, Tacoma
Rocky Mountain Sales Offices: Denver, Colorado; Salt Lake City, Utah

*G-E Form 9 Novalux with Elreco bracket and pole.*

# A New "White Way" at Moderate Cost

Miami, Fla., has just installed about 100 G-E Form 9 Novalux Units with diffusing globes and glass canopies to match mounted with brackets on "Elreco" combination railway and lighting poles, thus eliminating the cost of special poles and dividing the expense with the street railway company.

Attractive and efficient street lighting is not a luxury but a necessity and pays for itself many times over in added safety, better business and satisfaction in civic pride.

*G-E street lighting specialists are at the service of any community*

**General Electric Company**

General Office Schenectady, N.Y.

Sales Offices in all large cities

Pacific Coast Offices in: Los Angeles, Portland, San Francisco, Seattle, Spokane, Tacoma
Rocky Mountain Offices in: Denver, Colorado; Salt Lake City, Utah

35C-87

# ALPHABETICAL INDEX TO ADVERTISERS


Alexander & Lavenson ... 38
Allied Industries, Inc. ... 39
Allis-Chalmers Mfg. Co. ... 31
American Vulcanized Fibre Co. ... 42
Anaconda Copper Mining Co. ... 8
Austin Company, The M. B. ... 28

Baker-Joslyn Company ... Inside front cover, 3
Bates Expanded Steel Truss Company ... 52
Books, Technical ... 48
Bryant Electric Co. ... 24

California Wire Co. ... 49
Chicago Fuse Mfg. Co. ... 37
Clifton Manufacturing Co. ... 47
Coffin Valve Company ... 14
Condit Electric Mfg. Co. ... 9
Crocker-Wheeler Co. ... 40
Cutler-Hammer Mfg. Co. ... 33

Davis, R. J. ... 39
Dredge, Theo F. ... 38
Duncan Electric Manufacturing Co. ... 37
D & W Fuse Works of G. E. Co. ... Inside back cover

Edison Lamp Works of General Electric Co. ... 53
Electric Appliance Co. ... 5, 39
Electric Controller & Mfg. Co., The ... 29
Electric Power Equipment Corp. ... 10
Electric Railway & Manufacturers' Supply Co. ... 39
Emerson Electric Mfg. Co. ... 45

Federal Electric Company ... 38
Fobes Supply Company ... 39

General Electric Company ... 54, 55

Hemingray Glass Company ... 39
Hill Hubbell & Company ... 18
Howell Electric Motors Co. ... Front cover
Hubbard & Company ... 6
Hubbell, Inc., Harvey ... 17

Illinois Electric Company ... 39
Indiana Steel & Wire Works ... 51

K-P-F Electric Co. ... 51

Lapp Insulator Co., Inc. ... 56
Listenwalter & Gough, Inc. ... 38
Locke Insulator Corp. ... 7

Magee Furnace Company ... 25
McGill Manufacturing Company ... 39
McGraw-Hill Book Co., Inc. ... 27
Minerallac Electric Co. ... 56
Montana Electric Co. ... 38
Moore & Company, Chas. C. ... 50
Morganite Brush Co., Inc. ... 52
Musgrave, H. J. ... 39
Myers Electric Supply Co. ... 38

National Metal Molding Co. ... 43
New York Insulated Wire Co. ... 49

Ohio Brass Co., The ... 15
Ohio Electric & Controller Co. ... 50
Oshkosh Mfg. Co. ... 46

Pacific Coast Steel Co. ... 47
Pacific States Electric Co. ... 6, 7, 8, 39
Paine Company, The ... 38
Pass & Seymour, Inc. ... 26
Peerless Electric Company ... 44
Pelton Water Wheel Co. ... 45
Phillips Wire Company ... 40

Reiman Wholesale Electric Co. ... 38
Riter-Conley Co. ... 34
Robbins & Myers Company ... 30
Rockbestos Products Corp. ... 4
Roebling's Sons Co., Jno. A. ... 38
Roller-Smith Company ... 44
Rome Wire Company ... 50
Rutenber Electric Co. ... Back cover

Simplex Electric Heating Co. ... 16
Simplex Wire & Cable Co. ... 43
Smith Co., S. Morgan ... 47
Standard Felt Co. ... 46
Standard Underground Cable Co. ... 51
States Co., The ... 43

Thomas & Sons Co., The R. ... 36
Trumbull Elec. Mfg. Co. ... 42

U. S. Electrical Mfg. Co. ... 32

Wagner Electric Co. ... 11
Washington Electric Supply Co. ... 39
Western Electric Co. ... 35
Western Light & Fixture Co. ... 39
Westinghouse Electric & Mfg. Co. ... 19, 20, 21, 22
Wholesale Electric Co. ... 38

Y. M. C. A. Employment Service ... 38



**Minerallac Insulating Compounds**

High-grade compounds for use in making Cable Joints and in filling potheads, end bells, etc.

Our representatives will be glad to discuss your requirements.

*Coast Agencies:*

SPECIAL SERVICE SALES CO., 502 Delta Bldg., Los Angeles
A. F. DOUGLAS, 104 Prefontaine Pl., Seattle

MINERALLAC ELECTRIC COMPANY
Chicago, Illinois

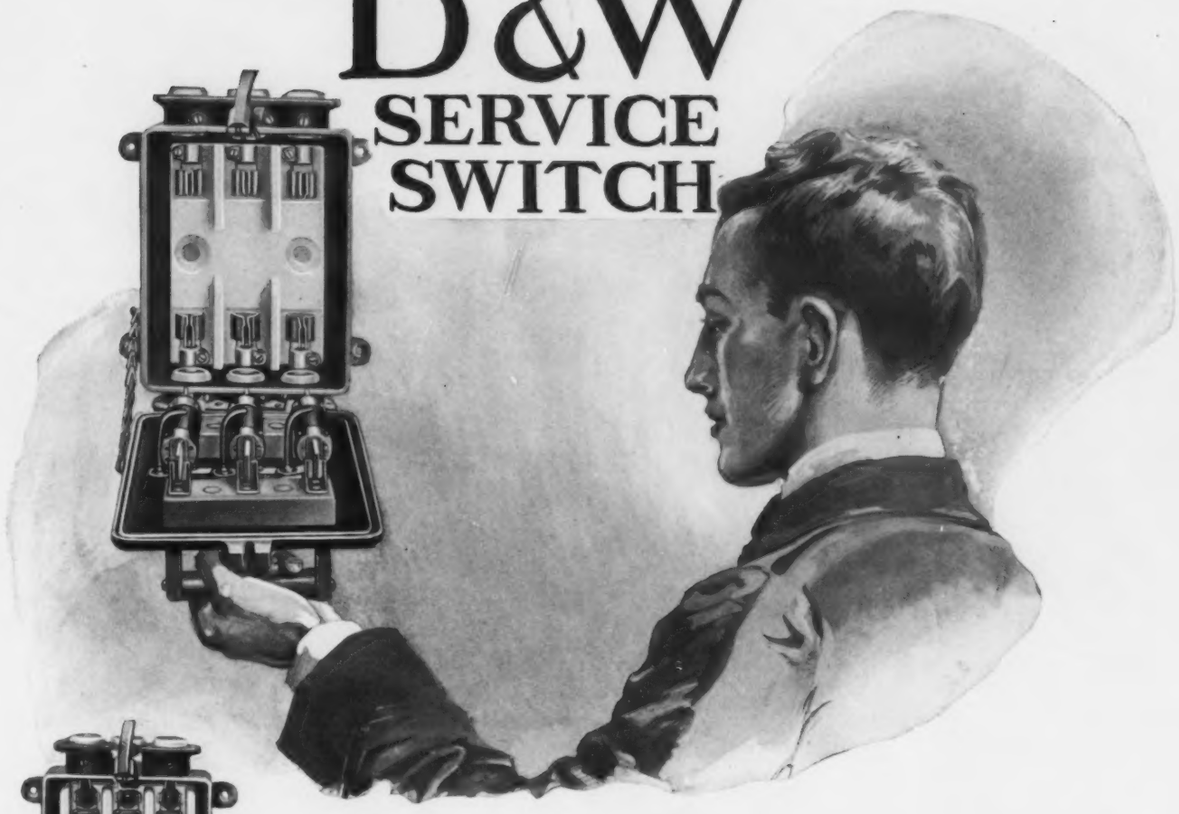
TRADE MARK

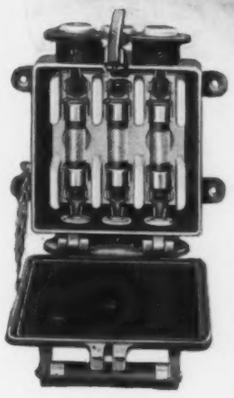
Lapp Insulators

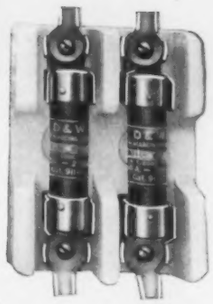
Lapp Insulator Co. Inc. Le Roy N.Y.

Pacific Coast Representative
S. HERBERT LANYON
New Call Bldg. San Francisco

# D&W SERVICE SWITCH







## A Quarter Century of Service

D & W Fuses have protected electric circuits for years — Service Switches and Fuse Boxes since 1897 — and they have met the most severe tests. Their long life is due to their sturdy construction.

A complete line of outlet hoods is available to connect D & W Fuse Boxes with conduit systems. D & W service switches and fuse boxes are equipped with rubber gaskets, which render the cast iron boxes waterproof. The cover is held shut by a special, easily operated latch.

D & W enclosed fuse cutouts are manufactured with the utmost care as to details. Permanent spring clips of phosphor bronze are used for ferrule type cutouts. In the knife blade type particular attention is given to lining up the blades, insuring perfect contact when a fuse is installed.

Every D & W box or cutout combines utmost protection with convenience. Ask us for catalog.

D&W

# Fuse Division

of General Electric Company

Bridgeport Connecticut

DWF 39

# Marion

## "The handle that fits the hand"

When one of the leading merchandisers of electrical appliances saw this new handle his first remark was—

—that new handle is the first real merchandising idea that the appliance business has had in years.

**If ever there was a time when new ideas will get you business, it's right now.**

This new handle will put new life into the iron business. Moreover, we have entirely redesigned our iron, incorporating every good feature of all the irons on the market today.

### Cash In on Curiosity

Can you imagine anything that will arouse the curiosity of passers, or incite the inquiry of shoppers to the extent that this will?

And the beauty of it is that the minute a prospect slips her hand into "the handle that fits the hand" she wants it.

The advantage is so self-evident that she sells herself on it—this means quick turnover. Yes, the new Marion Iron with "the handle that fits the hand" will ginger up your entire appliance business.

We expect to ship samples in July and to take care of quantity shipments in the rotation in which they were received.

**Use the coupon today unless you want to be a trailer in your community.**

## Rutenber Electric Company

**Marion, Indiana**

Rutenber Electric Co., Marion, Ind.

Please ship us as soon as possible item checked below:

One New Marion Iron prepaid, list price $7.50; we will remit your special net sample price of $4.75 delivered or return for credit in 10 days.

Standard Package of 6 New Marion Irons that retail at $45.00 at your special introductory price of $27.00 prepaid.

Name..... City.....

Street Address..... State.....

Jobber's Name .....

### Perfect Iron — Perfect Handle

Nothing would suit us quite so well as to have every electrical man inspect the material and the construction of this wonderful New Marion Iron. Nowhere will you find—

—such a clear mica core with hand laced resistance unit.

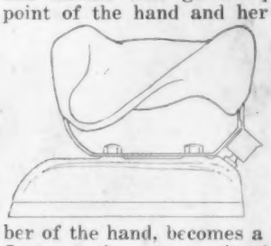
—such substantial connectors.

Check the dozen-and-one points which you know as weak spots—you won't find them in the New Marion.

This picture shows the saddle at rear of handle.

### Banishes Ironing Fatigue

Just let a woman slip her hand into this saddle-like handle that gives equal support to every point of the hand and her instant expression is "My, how comfortable."



Yes, they like it. Instead of gripping tight on a light piece of broom stick she finds support for the entire hand.

The thumb, which is the strongest member of the hand, becomes a real help in ironing. Just get them to try it, they'll buy it.

LEAg 25